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Cincinnati, Ohio 45230

12 March 1976

Dear Mr. Vance,

Herewith I am sending you a copy of the latest edition of my list of fungi of Lassen Volcanic National Park. It contains just over 400 species or species groups. In this case, species groups refers to incompletely identified groups of specimens assigned to a genus or a family.

Last summer's collecting has netted a number of additions. Probably some 25 species have been identified to date with others to follow. A number of these identifications result in range extensions for the concerned species.

In the report I prepared last November or December I suggested that to continue this work it would be well to work in a season in which little previous work had been done. That is, I have not completely exhausted all possibilities for summer collecting, but the occasional additions made are not worth the time involved unless on some other type of duty and the additions are found in off hours. Last summer we were in the Park the first full week in September and the weather was with us. This resulted in a relatively large number of additions to the list. If it could be arranged that we could spend the last half of September and the first half of October in the area, and if it could be arranged that we could have transportation to collecting sites, and the facilities for taking care of the collections, a more complete product could be developed.

" If such accommodations and facilities could be arranged¹ might be made the subject of discussion. It might be out of the question. In any event I would like to head whether I should continue to think of the prospect.

In reference to the enclosed report, it could be made the basis of a paper which would be publishable. Have you any suggestions as ~~it~~ to its improvement? In its present form it follows the format used in my 1955 list of the fungi of Mount Shasta for which I have enough material to write a supplement. You will note that I have used no common names. In most cases common names would have to be invented. As it stands it is simply an annotated catalogue arranged in systematic order. Identifications are based on microscopic characters at the species level in most cases. Any comments and suggestions will be appreciated.

Very truly yours,

Wm. Bridge Cooke

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Wm. Bridge Cooke

SOME FUNGI FROM LASSEN VOLCANIC NATIONAL PARK

Edition of Winter, 1975

Wm. Bridge Cooke

INTRODUCTION

The fungi, usually referred to as members of the Plant Kingdom, are organisms which possess no chlorophyll, or pigments through which they can produce food supplies. Their assimilative bodies are usually colorless and rarely seen. They obtain their food by decomposing dead organic matter or by parasitizing living plants or animals, and absorbing the products of this decomposition process through the walls of the cells of the mycelium. Their reproductive units, spores, are produced in or on organized fruit bodies, usually, and these may assume interesting shapes and may be variously colored.

When we walk in the woods or meadows usually we do not realize the extent to which fungus activity occurs. Along the trail we pass at least two principal types of this activity without paying much attention to them except when we see the fruit bodies of an occasional showy fungus. Some of the plants we pass are being actively parasitized by minute species of which we are scarcely aware. The dead remains of all plants and animals are being actively and rather rapidly disintegrated by other types of fungi which may be called scavengers. If it were not for these scavenger fungi we would not be able to walk through the woods because of the large piles of undecomposed wood with which the ground would be littered. Many of these scavenger or saprobic fungi are living in the soil under the trail, along the trail, and in the woods, even to the creek bed over in the meadow, and under the water.

The most obvious fungi are represented by fruit bodies which we call mushrooms or toadstools, puffballs or brackets (conks). These fruit

bodies are to the fungus organism as apples are to the apple tree - only the fruit bodies. On or in the gills, tubes, or spines on the underside of the cap are produced the many thousands of spores which, when the proper conditions for growth occur, reproduce the mycelium on which the fruit bodies are borne. In Lassen Volcanic National Park there are two principal seasons in which these fruit bodies are produced. In between these seasons the mycelium growing in the ground, wood, or plant, probably stores up enough nourishment so that when the fall rains come, or the snow melts in the spring, the fruit bodies can be produced quickly. For this process water is required and as soon as it is available the fruit bodies are developed from buds which probably have already been formed, but as soon as snow comes in the autumn and covers them, or as soon as snow-melt water dries up in the spring or early summer, these delicate fleshy fruit bodies dry up and disappear. Usually, one type of mushroom fruits in the spring, another in the autumn. Probably many kinds are edible but we are not yet sure which these may be, and since several common species are poisonous it is best not to consider gourmet possibilities until more field studies have been carried out.

Large, medium, and small mushrooms are not the only types of fungus fruit bodies which can be found in the Park. There are conks of wood-decay fungi, cup-fungi, mildews, molds, and coral-fungi, among others. To get an idea of how these types fit into the general picture of the fungus world we shall survey this interesting group of organisms briefly. After surveying the morphological types of fungi potentially present in the Park, we will survey the biological groups known to be present in the Park. Finally, an annotated list of those species found by the writer and reported by others from the Park will be presented.

MYXOMYCOTA

Myxomycetes or Slime Molds

A primitive but highly organized group of organisms, usually assigned to the fungi, are the slime-molds or Myxomycetes. These tiny organisms live in decaying materials such as logs, humus in the soil, and decaying plant stems. At first they are tiny bits of naked protoplasm. As the protoplasmic mass, or plasmodium, develops it moves from place to place like a small, then larger, amoeba. It ingests dead material as well as living protoplasm such as bacteria, minute plants and animals, and other substances. When the plasmodium has reached a certain stage in its development it comes out of its substratum and onto the surface, piles itself up into many little piles, or into one or two large masses, and develops its spores. The spores are piled into or onto delicate networks of various sizes, shapes, and colors. These usually are found at the end of the spring season after the snow has melted away. While the fruit bodies of most species can be seen with the naked eye, their structure must be studied under the microscope.

EUMYCOTA

MASTIGOMYCOTINA - Aquatic Fungi

Generally considered the more primitive subdivision of true fungi, the alga-like or aquatic fungi are adapted to life in the water for which their zoospores are furnished with one or both of two types of flagella. To my knowledge, no attempt has been made to recover fungi of the three classes assigned here from waters in the Park's lakes and streams although a number of species in at least the Chytridiomycetes and the Oomycetes should be present. Several species of Oomycetes may also be present in films of

water present around soil particles in moist soils. Many water molds grow attached to sticks or leaves in lakes or pools in streams. They may cause diseases in the minute plants or animals (plankton) which inhabit such waters, and they may infect pollen grains which fall onto the surface of lake or pond. Others may produce a disease of fish and fish eggs.

ZYGOMYCOTINA - Zygosporic Molds.

Zygomycetes

The fungi assigned to this Subdivision are among the more primitive terrestrial fungi. Because of the possible wealth of insects, hosts to many species of Trichomycetes, fungi of this class may be expected in the Park, but none have been reported. Zygomycetes are found in the soil and on decaying organic matter. Only a few species are listed here and more may be expected to be found in the Park. Some are insect parasites, others attack senescent mushrooms, and others infest prepared foods which are not refrigerated or preserved and stored properly. In this latter habitat some species are suspected of producing toxic substances and otherwise spoiling the food for man's use. However, as producers of decay in dead organic matter, these fungi are useful in returning to the soil elements and compounds useful to the plant and animal life growing there.

ASCOMYCOTINA - Sac Fungi

A third major group of fungi, the sac-fungi, or Ascomycetes, is so-named because the spores are usually produced in little clup-like sacs. The spores produced in these sacs or asci (singular: ascus) usually are found in groups of eight. Sometimes other numbers like 2, 4, 16 and rarely larger numbers are found. If the asci are produced in cup-shaped structures,

or modifications of cups like morels or truffles, we assign the species to the Discomycetes (cup-fungi). If the asci are produced in flask-shaped structures, or modifications of these, we assign the species to the Pyrenomycetes (charred-wood fungi). Some common members of this group modify wood so that it appears charred. Other Ascomycetes are assigned to the Hemiascomycetes, a group in which no definite fruiting structure is produced; the Loculoascomycetes, a group in which the asci are produced in locules sometimes simulating perithecia; and the Plectomycetes, a group in which the asci are produced in closed cleistotheca.

The Hemiascomycetes include several interesting groups of fungi of great importance. One group causes important plant diseases such as the leaf curl of peaches. Relatives of the peaches and cherries which grow in the Park, as well as other kinds of flowering plants, may be attacked by these fungi. Where chaparral is found along the highway on the north side of the Park the bitter cherry is attacked by a fungus of this type which forms large witches' brooms on the leaves of which the fungus fruits. These leaves become yellow, thickened and distorted. The scales of the cones of the alder bushes throughout the Park are occasionally extended in size, strongly contorted, and turned purple by one of these fungi. Wild yeasts are not yet too well known and have only recently been searched for systematically in the Park. However, they occur in rotting wood, soil, sediments in creek beds, on the surfaces of fruits and mushrooms, in insect tunnels in living trees and in old logs, and almost anywhere one could look for them. They have been found in soils in the Manzanita Lake Campground, at the Visitor's Center, and near the lakes along the highway below the summit pass. Such yeasts may not ferment sugar to form alcohol, as in the case of the wine, beer, and bread yeasts, but other substances are used,

other products may be produced, and the yeast-fungus contributes to the rapid removal of the substrate tissues. A recent project of international interest relates in part to yeasts found in insect galleries in dead wood. A team of American and Japanese yeast specialists is comparing yeast populations in such galleries in wood around the Pacific Basin, including Lassen Park, locations in Alaska and Japan, as well as other Pacific areas.

In the Plectomycetes are found many kinds of fungi usually appearing as molds and occurring mostly in the soil and on decaying wood. The mold stage is imperfect, and if two compatible strains of these molds mate a cleistothecium is produced in which the ascospores are formed. Not all molds develop a sexual state and few such species have been found in the Park although many molds have been found in the soils which were tested.

Loculoascomycetes and Pyrenomycetes grow on decaying logs, standing trees, living and dead parts of plants, and almost anywhere where their sources of nutrients occur. Both powdery mildews on leaves and stems of many kinds of plants, and sooty molds on a few plants in the area, may be found in the Park. The smothering fungi found as brown webs covering the leaves or needles on the twigs of most cone-bearing trees in the Park belong in this group. The parts of plants which have died and are in the process of decay are being destroyed largely by members of this group whose fruits may be tiny and inconspicuous. A large number of leaf spots and other types of plant diseases are caused by members of this group of fungi. On rotting logs an interesting type of fungus is one which produces a tiny fruit body which looks like a tiny canoe with a long narrow slit along the top. As this is moistened by melting snow or prolonged rain it opens to appear like a tiny cup. On the needles of many conifers are found many species of these fungi whose fruit bodies are formed like long canoes;

but on the needles these open only wide enough to let the long, slender spores be discharged to the air for transport to other needles where they repeat the disease. A very interesting group of Pyrenomycetes is the one which fruits on the dung of various types of animals, especially those which eat grass and herbs. These fungi usually have spores which are embedded in a slimy substance. When the spores are shot or squirted from the vessels in which they are produced they may land on a blade of grass to which they may adhere. When a deer or other herbivorous animal eats this grass the spores go with it and the digestive juices of the animal may start the process of germination of the spores.

Discomycetes grow on rotten wood, soil, dung, and even sometimes on leaves and stems as parasites. As the snow melts in the spring, or as summer and autumn showers occur, these become readily visible. Those growing on wood freshen up, open up, and expose their colorful cups or other fruit bodies. There are many species which grow on conifers, either on living branches, or on dead or dying parts of the trees. Some form serious cankers. Dull to bright colored species occur on the ground, both on fragments of litter, wet wood in streams, or on bare soil. The larger species of this group include some of the better mushrooms like the morels or sponge-mushrooms. The truffles are cup mushrooms which have gone underground to fruit, and because of the method of spore production have mostly lost the capacity to discharge their spores violently.

BASIDIOMYCOTINA - Club Fungi

The fourth principal group of fungi is known as the Basidiomycetes, now referred to as the Subdivision Basidiomycotina. These can be called the "club" fungi because the spores are usually borne in sets of four on

tiny club or club-like structures called basidia (singular: basidium). Some of our more important leaf disease and forest disease fungi belong in this subdivision. It is divided into three classes: the Heterobasidiomycetes including the rusts, smuts, and jelly-fungi; the Homobasidiomycetes including the bracket fungi and the mushrooms; and the Gasteromycetes including the puffballs and false-truffles.

Almost every species of leafy plant has its rust parasites. Some species are host to only one rust species, others to several. Rarely does a rust really kill a host, but the rusts cause a lot of trouble especially in crop plants. The black stem rust of wheat is a very serious problem to farmers. Other cereal grains and crop plants have their rusts which cause much loss. Wild plants are subject to a wide range of rust species. Damage may be in the form of small pustules on leaves or stems, or it may take the form of deformations like galls, blisters, and witches' brooms, always accompanied by loss of vitality, reduced storage of food materials, and even sterility. Some forest trees are more severely attacked by rusts than others. White pines, or five-needle pines, are attacked by the white pine blister rust which, fortunately, has not been reported from the Lassen area as yet.

Another type of disease of plants is generally called smut. A large number of species of plants is subject to attack. Grasses may have the smut in their flower heads, or in their stems or leaves. The smut may sterilize the plant without killing it. Some species of sedges may have their fruits completely replaced by large balls of smut spores. Other plants are subject to attack in either flower parts, such as stamens or ovaries, in leaves or stems.

The jelly fungi are found commonly only on decaying wood in the

forest. Because of their very large water content they shrink into almost unrecognizable bits of material when they dry up. Some are not particular whether they grow on hardwood or conifer wood. Because they are easiest found on ^{wet} ~~wet~~ wood as the snow melts, or during summer or autumn rains, they are not collected frequently.

Bracket fungi are among the more conspicuous fungi of the forest. The fungus producing the bracket or conk causes most damage to wood and thus forms an important problem for foresters and the forest pathologist. A related group of fungi does not produce brackets but fruits as thin effusions on the lower surface of sticks, twigs, or logs. Throughout the fungi of this group, the surface on which spores are produced is modified from smooth to toothed or spinose, to porous or lamellate. The fruiting bodies of these fungi are usually fleshy to tough, leathery or even woody. Some species produce fruit bodies which are perennial, adding a layer of growth year after year, or season after season, for periods of time usually determined only by the length of time the tree on which the conk (fruit-body) grows lives, or the length of time the food used by the fungus is still available.

Mushroom- and toadstool-producing fungi live in the soil or in rotting wood. A large number of species is known and many of these occur in our western country from the deserts through the dry grasslands to the ponderosa pine woodlands, the oak groves, the mixed conifer forests, and the subalpine and timberline country. Most of the fruit bodies that we find occur on the ground. A few species fruit on dead wood, a few are found almost underground for they push up under duff and litter forming small mounds which have to be dug into to find the mushroom. The mycelium which produces the mushroom derives its nourishment from decaying organic

matter. Much of this material is in the soil mixed up with sand and gravel. But many mushroom-producing fungi live in such a way that their mycelium and the root tips of conifer trees become intermingled in a structure called a mycorrhiza - a fungus-root. Here the tree derives a supply of nitrogen and other chemicals it cannot readily obtain by itself from the fungus; the fungus receives water and various types of nutrient from the tree. In this relationship neither organism normally harms the other, both are benefitted. In fact, in certain areas such as the dryer lava covered portions of northeastern California and eastern Oregon, trees could not easily survive unless such fungi grow in the region. It is possible that this is true of many forest areas in Lassen Volcanic National Park.

Gasteromycetes are fungi whose fruit bodies may be minute or may reach very large proportions (from less than the size of a pinhead to more than 1.5 feet in diameter. Several species have fruit bodies hardly more than a millimeter in diameter, while the giant puffball has fruit bodies which may reach two feet in diameter and contain more than seven and one-half trillion spores. Most people are familiar with puffballs which are the fruit-bodies of the best-known species of the group. It is quite likely that the showy Sierra puffball with its large pyramidal wart-like scales occurs in the Park, but it is not likely that the even more showy but malodorous stink-horn fungi will be found here. Earth stars are the fruits of fungi whose outer wall splits open like the rays of a star leaving the little puffball inside exposed to the winds and rains; a large species of this kind of fungus is known in the Park. Because false-truffles occur commonly in neighboring areas, members of this group of fungi which fruit under the surface of the ground should be found here more extensively than this report indicates. So far about a half dozen such fungi have been located,

A medium sized type of fungus fruit-body which looks as if it might become a mushroom but which never opens is common in the fir and hemlock woodlands after the snows melt in the spring and early summer; two similar appearing species are known in the Park.

DEUTEROMYCOTINA - Fungi Imperfecti

A very common and very numerous group of fungi includes those thrown together in an artificial assemblage, a fifth subdivision, the Deuteromycotina, or Fungi Imperfecti. As its name implies, species in this group are imperfect - that is, they are not known to have a sexual stage in their life histories as other fungi do, or if a sexual state is present it is rarely found. Many of the species in this group are parasitic upon leaves and stems of plants, others grow on decaying wood, litter, soil and similar materials where food is available. This group of fungi is divided into smaller assemblages on the basis of whether or not the spores are borne in flask-shaped bodies (pycnidia), in open discrete pustules, or in irregular masses scattered on or covering the surface of the thing on which it grows or on adjacent materials.

Lichens

From the above survey it may be seen that the fungi form a very complex group of organisms which have become adapted to many different types of habitat and many different ways in which to grow. One special type of adaptation has still to be mentioned. Since fungi have no pigments, like chlorophyll, with which to manufacture food, they must live by taking food from other things - living or dead plants or animals. It has become convenient for many types of Ascomycetes to form partnerships with various

species of algae. Algae are primitive plants, or plant-like organisms, formed of single cells or chains of cells in each cell of which is the green material, chlorophyll, by means of which the alga is able to make its own food from carbon dioxide and water in the presence of sunlight. We are familiar with these tiny organisms although they may not have impressed us deeply. They may form a green film over tree bark, they grow in ponds where they form a scum along the bank, or in the water, or on the stems of higher plants growing there; some of them live in the hot springs or fumaroles at the summit, at Sulphur Works, or at Bumpass Hell where they contribute to the colorfulness of the area. Their larger relatives growing in the ocean are called seaweeds.

The fungus and the alga growing together form a composite structure which in general is called a lichen. The fungus furnishes shelter and moisture to the alga while the alga furnishes nitrogen and some vitamins to the fungus. Lichens are found in many habitats. The most striking species, seen by almost everyone who has driven through the Park, is the staghorn or wolf lichen. This species clings to the bark of trees where it forms large bushy growths which are yellow to apple green. Along the Summit Trail and on many rock outcroppings all over the Park there are many species of lichens of which some are red, orange, yellow, blue, green, grey, white, brown, and even black. Sometimes there are enough lichens present to color a rock face any or all of these colors. Of course, at a distance, a person should not confuse the color of lichens with the natural color of the rocks or with other materials which may color them.

ECOSYSTEMS

There are three major types of organisms, the producers, green plants with chlorophyll which, in the presence of sunlight, produce sugar from water and carbon dioxide. From this sugar all substances necessary to the plant are produced. Consumers are organisms which cannot produce their own food but which must consume producer organisms by ingesting them. Secondary consumers consume primary consumers. Reducer organisms cannot manufacture their own food but must absorb their nutrients from preformed organic matter. Such organic matter has been formed by producer and consumer organisms as well as other reducer organisms.

A complete ecosystem is one which includes members of all three of these groups. In the following survey a brief characterization of fungal associations and forest associations will serve to introduce the types of assemblages of producer and reducer organisms. Consumer organisms are present but are not considered here. A list of the fungal reducer organisms found to date will be presented with notes on the occurrence of individual species of fungi. ~~There are two types~~

There are two types of reducer organisms, the prokaryotic bacteria without an organized nucleus but with nuclear material scattered through the cell, and the eukaryotic fungi with an organized nucleus usually surrounded by a nuclear membrane. While the bacteria are small, their numbers are large. They are more common in warmer soils and they may accompany decay activities of fungi as well as initiate some of their own. They occur in hot springs to the temperatures of which certain species are well adjusted. The fungi are the principal reducer organisms, at least as far as size and certain types of activity are concerned. They are relatively intollerant of hot springs but are common in all soils and decaying wood,

plant residues, and animal remains. Many fungi are well adjusted to the cold temperatures of higher altitudes and a number of species flourish around melting snow-banks where temperatures are just above the freezing point. Several species develop and are active in the high humidities furnished under a blanket of snow.

In the economy of nature, as represented by areas within the National Parks, all degradative activities of fungi are a product of natural activities of native organisms. In the economy of man, as represented by areas within National Forests, and most areas outside of National Parks and National Forest Wilderness Areas and Study Areas, degradative activities of fungi are wasteful of potentially commercial products and must be controlled or eliminated. Some of these activities will be discussed briefly.

Fungus Associations

Just as green plants can be said to occur in associations, so under certain circumstances fungi also appear to be arranged in associations. Fungal associations are largely edaphic in that they are based on common nutrient supplies. As the nutrients available to a fungus become exhausted, that fungus fruits or goes into a resting state until a new source of nutrient becomes available.

There are habitats which may be considered generalized in which a number of kinds of fungi occur together. In the case of the soil, there are species which occur generally distributed in it, others are associated only with the rhizosphere, rhizoplane, or root surface of vascular plants. Some are living only on humic acids, others only on sugars released by their own activities or by the activities of other organisms, still others are living on various unidentified substances. On or in a rotting log

there are fungi on bark, on sapwood, and on heartwood. Some of these fungi are associated with bark tissues, some with cellulose, some with the lignin in the wood. A true association of fungi, for example, would include only species growing on cellulose, or only species on lignin, or species utilizing both cellulose and lignin, so that several associations could be living in the log as they decompose it.

Plant Associations

In Lassen Volcanic National Park the lowest elevations are covered with forests wherever forest trees can gain a foothold. After disturbance of such a forest by nature in the form of volcanic activity, glaciation, etc., or by man, as a result of logging, man-caused forest fires, or clearing for settlement, the area may be taken over by a seral (temporary) chaparral growth, or in areas where growth conditions are not favorable to a closed forest or to normal growth of trees, trees may be widely spaced or dwarfed. In an ascending series of climatic changes related to temperature, precipitation, and probably other factors, habitat conditions vary and the groupings of forest trees vary as each species reacts to these conditions. Three relatively easily defined belts of forest occur within the Park. These are described here on the basis of observation of qualitative characteristics rather than quantitative determinations, which may yield a different set of conclusions.

Sierra Mixed Conifer Forest

At the lower levels in the Park, this is the forest type which is commonly encountered. At Manzanita Lake and along the Highway almost to Summit Lake, in Warner Valley, along the road to Juniper Lake, and

around the Butte Lake and Cinder Cone areas, this is the commonly seen forest type. At its best and most complete expression it includes Western Yellow Pine (Pinus ponderosa), Jeffrey Pine (Pinus jeffreyi), Sugar Pine (Pinus lambertiana), Silver Fir (Abies concolor), Incense Cedar (Calocedrus decurrens), Douglas fir (Pseudotsuga menziesii), and occasionally Red Fir, (Abies magnifica), Lodgepole pine (Pinus contorta var. latifolia), and White Pine (Pinus monticola). Locally, variations may be encountered. More Incense Cedar is found in Warner Valley. Western Juniper (Juniperus occidentalis) may appear as an occasional tree on lower slopes on the east side of the Park. Lodgepole Pine may drop down to lower elevations on the north side, and Jeffrey Pine may appear in almost pure stands in the vicinity of Butte Lake and Manzanita Lake. The peculiar forest growth in the upper part of this forest in the Chaos Craggs region is a response to as yet incompletely understood edaphic factors related to nutrient poor soils developing on relatively recently volcanically disturbed sites.

Fir-Hemlock Forest (Abies-Tsuga Forest)

The widest forest band in the Park, around all the higher peaks, is composed of species assigned here. There are two major expressions of this forest. At lower elevations the communities are largely composed of Red Fir (Abies magnifica), while at higher elevations on moister or cooler sites they are composed of Mountain Hemlock (Tsuga mertensiana). White or Silver Fir may ascend into this zone, and the best expression of Lodgepole Pine forests is found in its lower elevations. White Pine is found in it occasionally. Descending into the Red Fir forests may be found Mountain Hemlock which may also be scattered in upper forests in areas where pure stands are not formed. Occasional specimens of White Bark Pine

(Pinus albicaulis) may be found in upper levels of this zone, especially in areas adjacent to the White Bark Pine forest. In such cases the tree may assume tree-like aspect rather than the more shrubby aspect of higher elevations. The second major expression of this forest is largely composed of Mountain Hemlock. Solid stands of this species are found in higher areas where remnants of the winter's snow cover persist as increasingly smaller snow-banks into early or mid-summer forming reservoirs of moisture on the surface of the ground, and possibly acting as a refrigerant for root systems which may require or grow better in lower temperatures. Lodgepole pine may reach up to this Hemlock forest but is more common in the Red Fir forests.

Shrub communities include colonies of Mountain Manzanita (Arctostaphylos nevadensis) on open rocky slopes, and in Red Fir forests where it is thought to represent evidence of earlier forest fires, Mountain Spray (Holodiscus microphyllus) with it or separately on similar slopes, and occasional Buck Brush (Ceanothus divaricatus) bushes. The Green Manzanita (Arctostaphylos patula) may occasionally reach this forest type when scattered shrubs are found with the Mountain Manzanita. Groves of stunted trees or of normal trees of Quaking Aspen (Populus tremuloides) are found occasionally, especially in the Hat Creek basin.

White Bark Pine Forest

This forest is dominated by White Bark Pine (Pinus albicaulis) and is represented only on Lassen Peak above the Mountain Hemlock forest into which it penetrates. It is largely represented by scattered trees of Krumholz aspect.

Alpine Communities

Above the limits of tree growth on all peaks over 8,000 feet,

there are communities of herbaceous plants, grasses, and sedges. These are usually found on open rocky slopes, beside large stones, or on open sandy or pebbly surfaces.

Heather Meadows

In moist areas and along small streams in the Fir-Hemlock, White Bark Pine, and Alpine communities, small scattered stands, or large populations of such heathers as Phyllodoce, Kalmia, and Cassiope occur. These may be under Hemlock, Fir or Pine groves, or in openings between or above stands of these trees.

FUNGUS ACTIVITIES

Plant Pathogens

One kind of fungus alone can cause a serious disease or death of a plant be it a one-celled green alga or, more rarely, a tree in a forest. However, one kind of fungus alone is not responsible for the decay of a single leaf, piece of herbage, or a single log of any kind of wood. One kind of fungus can attack one kind of substratum, another requires a different source of food. One cannot feed on a log until another has caused a kind of decay which releases food from it. If we start with a healthy tree we can watch the gradual death of the tree and the disintegration of its component parts. It must be remembered that after a tree falls space is yielded for the rapid development of new plants whose seeds have been waiting for an opportunity to germinate. This takes place while the old wood is being eliminated, that is, while it is being returned to the soil in the form of nutrients available to the new generation of plants occupying the new bare area.

The healthy tree may have a number of fungi associated with it.

On the surface of the root are the molds of the rhizosphere. These fungi use various exudates and dead cells which are sloughed off the root surface. There is a possibility that they may help to prevent attack by root disease organisms. In the root-hair cells and around them mycorrhizae produced by mushroom-, false-truffle-producing, and other fungi may be abundant. These structures may help the tree in obtaining some of its important nutrients from the soil. On the bark of branches, in addition to mold-type fungi, the small fruit bodies of the pink Aleurodiscus amorphus, and other harmless or not significantly harmful fungi may be noted from time to time.

Leaves of the Red Fir (*Abies magnifica*) may be parasitized by the rust fungus (Pucciniastrum goeppertianum) whose life cycle must be completed on the nearby blueberry (Vaccinium nivictum) bushes. On the needles of Jeffrey Pine may have developed a needle cast disease (Lophodermium pinastri) which either merely kills and removes the leaf, or causes the tree to produce distorted witches' brooms (Elytroderma deformans on Pinus jeffreyi). These are rather minor upsets except when they are so severe as to kill the tree or significantly reduce its timber-producing potential. The last named fungus may stunt the tree so that it may never be good for timber production. The branch which dies from the effects of a smothering fungus, Herpotrichia juniperi on firs and hemlock, or Herpotrichia coulteri on pines, or some other disease, or is broken from the tree by some accident may leave an unhealed scar, an infection court, through which the mycelium of wood decay fungi may enter the wood. Spores from conks occurring on other trees in the area are usually air-borne and some may land on the wound. Of these some may be able to germinate and the resulting hyphae grow into the cells leading to the heartwood of the tree. Here the fungus grows through the heartwood producing a brown rot if it uses the cellulose

and leaves the lignin, or a white rot if it uses the lignin and leaves the cellulose fibers. This action eventually weakens the tree. Some species are more active in the crown of the tree, others the trunk (Fomitopsis pinicola), and still others the base (Ganoderma oregonense). Some species even fruit on the trunk of the standing tree (Echinodontium tinctorium), but fruit bodies (conks) of some species whose action is evident have not yet been reported from the Park. Eventually the tree is weakened to the extent that a summer wind or a winter storm fells it; this is not to be confused with windfalls produced by heavy storm winds such as that of Oct. 12, 1962.

Forest Pathology

The practicing forest pathologist, the man who is familiar with tree diseases and their effects on the economic value of standing timber, is not one of the more enthusiastic supporters of the National Parks Idea. He hates to see a stand of over mature timber in which there are trees that harbor the spore-producing bodies of fungi which cause various types of tree diseases. He would love to get into such an area and remove the diseased trees, the older trees which are potential victims of disease, and the young stands in which the trees are too closely crowded together thus producing increased chance of disease. The National Parks, National Monuments, Wilderness Areas, and nature preserves of any kind in which cutting of trees for any reason is not permitted, form reservoirs of disease-producing organisms which could infect even younger timber in well-managed neighboring forests. Of course, such comments apply only to living standing timber. In the best managed, perpetual-yield-type forests, or

even in the poorest managed forests, the ground is littered with dead wood of many kinds which, much as in the litter-strewn National Park or nature preserve, is a reservoir of a wide variety of fungi, and such arguments apply only to ideal situations which may be found in the best managed demonstration forests.

As to the actual amounts of damage caused by these fungi, a few of the groups and species may be mentioned in particular. The brown-felt or smothering fungi cause little damage in the forest. They occur at high elevations where the snow cover occurs for prolonged periods of time. Rarely will a single small tree be covered; usually these fungi attack only one or several small branches. If the fungus occurs in high mountain forest nurseries, it can have serious effects.

Elytroderma deformans is a so-called needle cast fungus which also produces witches' brooms on trees in young stands. In Lassen Park it attacks only the Jeffrey Pine. Affected trees may die, but if they live they may live for long periods of time producing little or no appreciable growth, but forming a reservoir of infection. In this way it may seriously affect the Jeffrey Pine crop both inside and outside the Park.

A number of organisms cause mycotrophies of various types on the roots of various trees. A variety of bacteria and fungi live in the rhizosphere of trees. This is the area where the tree root meets the soil and in which the tree exudes waste products of metabolism which become the foods of these bacteria and fungi. Usually they cause no damage although some species may tend to be able to enter the root tissues and produce wilts. Some bacteria may form nodules on the roots of legumes, and others on the roots of such plants as alder and buckbrush (Purshia tridentata). These nodulations are shelters for those species of bacteria which fix

free nitrogen from the atmosphere making it available to the plant and other plants on the area after the nodulated plants die. A large number of fungi, especially among those species which produce mushroom-type, or false-truffle-type fruit bodies, form mycorrhizae with the roots of coniferous trees. These are beneficial to both the fungus which derives some of its nutrients from the tree, and to the tree which obtains certain nutrients through the activities of the fungus. Other types of mycorrhiza-producing fungi are associated with plants in the heath, orchid, and other families found in the Park. None of these fungi are normally harmful to the higher plants with which they live in harmony.

There is a large number of foliage diseases, not only of the coniferous trees, but also of the broad-leaved trees, shrubs, herbs, and grasses. Of greatest importance in the economic life of the forest are the rusts and the needle-cast producing fungi. Rusts are not common, and except for the Elytroderma mentioned above, neither are needle-cast fungi. The chickweed rust, Melampsorella cerastii, produces witches' brooms on the Red Fir, and has a tendency to stunt the tree because of the use of wood-building chemicals for production of the distorted branch system which has a peculiar odor. Occasionally, the Lodgepole Pine has a knot-like development on the trunk or branches. This is produced by a rust fungus causing a hypertrophy of the stem tissues. Rarely the firs are found to have leaves on occasional branches on which little orange or whitish cups are found. This is the asexual stage of the rust fungus which completes its life cycle on the dwarf blueberry in mountain meadows. In neither of these cases is extensive damage to trees in the Park noted, but epidemics of such diseases could be serious in heavily cropped forests. Usually the rust fungi do not kill their host. Other foliage diseases occur on

on broad-leaved shrubs, herbs, and grasses. They will be noted in the main list of fungi.

Among the more important fungi of the forest are those which cause rots and decays of living standing timber. The 1949 Yearbook of Agriculture gives the annual loss to the North American forest industries through wood rots as 1.5 billion board feet with a \$10 million value of the cull as stumpage or \$47 million value of the cull as logs. The heartwood of the tree is dead wood tissue and the most serious damage is caused to this tissue. The fungus spore enters the tree through an infection court, a wound in the wood, or the stub end of a dead branch. The fungus spore germinates and the hyphae grow in toward the heartwood which is reached eventually and forms the food of the fungus. With the destruction of the heartwood the strength of the tree is lost and it can fall more easily during a wind storm. After the death and fall of the tree the fungus rotting the heartwood can penetrate the sapwood which is now dead. In addition, other fungi can penetrate the sapwood and produce decays peculiar to that type of wood. Some fungi use the lignin in the wood, others use the cellulose, a few can use both, but a single wood decay fungus cannot rot away the whole tree. There are secondary types of decay fungi which use the substances the primary wood rots cannot or do not. Eventually, with the help of insects, protozoans, and bacteria, the fungi will remove most of the tissues of the tree leaving a space for additional tree seedlings to germinate and develop, keeping the forest in an ever continual state of development.

Among the white rot producers in Lassen Park are several of the less important species, if one estimates importance by the number of times the sporophores or conks of the fungi have been noted. Ganoderma applanatum,

the picture conk, has been found in Warner Valley and near Mineral on Abies concolor. It produces a white mottled rot in timber but has been observed only on a fallen log in the Park. Phellinus ignisarius, the false tinder conk, produces a white trunk rot in Salix lemmonii, Populus tremuloides, and P. trichocarpa. On the first two it was found on standing trees, on the third on a recently fallen trunk. In the Park it is of little importance. Ganoderma oregonense, the Oregon lacquered conk, has been found in the higher elevations twice but can be expected more often. It is reported to cause a soft spongy white rot but has always been collected on stumps showing signs of brown stringy rot. Cryptoporus volvatus, which usually girdles the tree by living in the cambium or growing area of the trunk between the wood and the bark, has been found on several kinds of conifers in the Park. After the death of the tree it may produce a superficial soft greyish rot of conifer slash and dead trees. Phellinus nigrolimitatus produces a white pocket rot in down timber, mostly on Mountain Hemlock. Hirschioporus abietinus produces a pitted sapwood rot of conifers. It has been found on most of the conifers in the Park. Bjerkandera adusta has been found on Populus trichocarpa wood in the Warner Valley. It produces a white mottled rot mostly in the sapwood.

Among the brown rot producers are some of the more important decay producers in the Park. The commonest of those observed is Fomitopsis pinicola, the red belt conk, which forms a brown cubical rot in sapwood and heartwood mostly of firs. Its conks are usually common but malformed possibly because of the long winters and dry summers. Probably much of the brown rot in the Park, especially in older trees, has been produced by the activity of this fungus. Occasionally conks of three other brown rot fungi are found. Laetiporus sulphureus, chicken-of-the-woods or sulphur conk, was found on

a Red Fir snag near Lower Twin Lake; Laricifomes officinalis was found on a fallen log and on a standing Lodgepole Pine near King Creek Meadows; and Echinodontium tinctorium was found on several trees of Silver Fir near the Warner Valley campground. A fungus which is always associated with conifer slash and cut logs is Gloeophyllum sepiarium which forms a brown pocket rot in wood which it infects. Two other decay fungi found typically in alpine or subalpine areas in the western states are represented in Lassen Park. These are Spongiporus leucospongia and Aurantiporellus alboluteus. Both fruit when their host logs are under the winter snowpack. The fruit bodies of the latter are usually eaten by small beetles within three weeks of the melting of the snow. In the higher elevations of the western mountains, in the National Parks and possibly in the National Forests and elsewhere, road guards, bumpers, and other structures designed to make roadsides and parking lots safer, untreated logs of native conifers are used as they are available. They are quickly rotted away by Spongiporus leucospongia. Otherwise the fungus causes no significant economic losses. Unprotected timbers used in building construction are subject to decay by the dry rot fungus, Serpula lacrimans. The wild form of this species has been found occasionally on logs of conifers in the Park, as well as on logs in a log cabin built directly on the ground near Summit Lake.

Wood Decay

A log may lie on the ground for several years without showing signs of becoming rotted; in the meantime the fungi already living in the heartwood are continuing their activities and those which may have been introduced under the bark (Cryptoporus volvatus) by bark beetles are starting to have their effect. Additional species attack the now dead sapwood

(Hirschioporus abietinus) as well as the already dead heartwood (Guepiniopsis alpinus, Mycena lilacifolia, Hydnotria veriformis) and bark (Collybia bakerensis). Additional species produce conks (Aurantiporellus alboluteus, Spongiporus leucospongia) or fruiting effusions (Corticium, Peniophora, Poria species, and segregates of these genera) on the decaying wood. Many different kinds of fruiting devices can be observed depending on the different kinds of fungi which are using the wood as food and decaying it. Several kinds of mushrooms (Mycena overholtsii, Galerina autumnalis, Pholiota bridgii) like this habitat and will fruit especially around snow as it melts, irrigates the wood, and keeps the humidity of the air high, or in wet rotting logs. As the decay process continues, the wood gets more and more rotten and still other kinds of fungi, such as the bushroom Mycena griseo-viride, are able to grow and fruit in this rot.

In the meantime, the twigs and branches are attacked by other fungi, little cup mushrooms whose yellow discs (Trichoscyphella arida, Lachnellula agassizii, L. chrysophthalma) are very colorful when wet by a summer shower, or jelly fungi (Dacrymyces punctiformis, Guepiniopsis alpinus) which come to freshness quickly when moistened; and a wide variety of slash rot fungi. So the old wood is removed and the new forest develops in place of the old.

All kinds of shrubs and most kinds of herbs and grasses are also parasitized by fungi, and their dead wood (Aleurodiscus difissus on both kinds of manzanita), leaves and herbage are quickly removed by a variety of types of saprobic fungi. These fungi are usually inconspicuous and their effects may not be unsightly. In fact, the red blight (Exobasidium vaccinii) of manzanita lends spectacular color to the chaparral, while the witches' broom (Taphrina confusa) of bitter cherry causes unsightly

distortions of branches of its host. Even the rein orchis (Aecidium graebnerianum on Habenaria leucostachya) of the wet meadow, and the marsh marigold (Fabrea rousseauana on Caltha biflora) are not immune to the action of fungi, and the melting snow uncovers last year's herbaceous stems which are being rapidly decayed by a variety of tiny fungi. (Leptosphaeria vagans, Metasphaeria sepalorum, etc.).

Snow Bank Fungi

At higher elevations, precipitation in the form of snow starts relatively early in the year and the resulting snow stays on the ground for long periods of time. Even before the snow starts to fall, temperatures have declined in the soil and rotting wood because of shorter days and generally colder weather in late autumn. Such conditions have led to the development of a number of fungus species which have become adapted to the colder environment. These are cryophilis, cold loving, at least in part.

Among these cryophilic fungi are two parasites of conifers. Herpotrichia juniperina on firs, hemlock and incense cedar, and Herpotrichia coulteri on pines, produce most of their growth and fruit on needle-covered branch tips while these are under the snow. Apparently they require outside moisture and high degrees of relative humidity. They form brown felt-like growths which cover the needles and prevent them from performing their photosynthetic functions after the snow has melted.

A number of fleshy fungi fruit around melting snow. Hygrophorus goetzii mushrooms are found around the edge of melting snow-banks and some fruit bodies are found growing up in the snow. Lyophyllum montanum fruits in the moist duff at the edge of melting snow. Plectania nannfeldtii (or Paxina nigrelle) grows attached to rotting sticks within a few inches

of melting snow. Mycena overholtsii fruits on decaying wood as the snow is melting and fresh fruit bodies are found only on wood still being irrigated by melting snow water. At the edge of melting snow banks or in piles of rotten wood still wet from melting snow water Mycena griseoviride is found. The orange cup (Caloscypha fulgens) is common on soil irrigated by melting snow and sometimes is very abundant. A variety of other fungi is also found near melting snow. In many cases it may not be easy to decide whether these fungi actually require the combination of habitat factors found near melting snow, or merely tolerate them.

Soil Fungi

The soil is a living community of fungi, bacteria, algae, protozoans, worms and small animals of various sorts, burrowing animals, and plant roots, embedded in a matrix formed of gravel, sand, silt, and clay particles as well as humic materials formed from decaying litter materials. Each of the kinds of organisms living in the soil has its own particular part to play in the formation, development, and maturing activities of a soil. The mineral portion of the soil is derived from the rock of the area. Here in Lassen Park the parent material is andesitic and basaltic lava. As this rock decomposes it forms a sand, coarse or fine or dust-like depending on various factors of age and deterioration. Leaves fall to the ground, roots die, and fungi use these bits of organic matter as food. The acid the molds secrete, as well as that secreted by the lichens on the face of the rock, and the root-hairs penetrating everything, help to decompose the larger rock fragments, as well as the smaller. The fungus cells use what they can of the dead leaf and root tissues and what is left is attacked by small animals. Again the remains of this activity are attacked by fungi until all that is left are humic acids which decompose

slowly. We know little of how humic acids are decomposed, but it is suspected that certain types of fungi which produce mushroom-like fruit bodies, as well as other fungi, may be involved.

All fungus cells, during the actively growing and assimilative stages in the growth of a fungus, must be bathed in water. This does not mean that the soil in which they live must be water logged, but it must be moist so that the relative humidity in the air spaces which are abundant in the soil is at or near 100 percent. When the soil starts to dry out several weeks after the snow has melted, then the fungi must make arrangements to go into a resting stage until enough moisture comes again for their growth to continue. At high elevations this means that many fungi must grow at relatively low temperatures and this is especially true of the brown felt or smothering fungi which occur on the needles of the branch tips of pines, firs, and hemlocks. This kind of fungus appears to grow only under the snowpack where it is well insulated and the humidity is always high. It has been found that at high elevations and high latitudes there are fewer bacteria than fungi, proportionately, than at lower elevations and more southerly latitudes where temperatures are usually higher.

A very small amount of work has been done to determine some members of the soil populations in the Park. Two areas in particular were chosen for attack. In the first the water and lake shore soils at Emerald Lake and Lake Helen were used. Unfortunately, the soils which were collected were stored in a refrigerator for five years before they were processed, but even then 12 species or species groups of fungi were recovered (Table 1). In the second, ten samples of relatively dry soils were obtained in the Manzanita Lake area. These were processed within a few weeks of the time of collection and yielded a total of 50 species or species groups (Table 2).

Three of these samples were taken in the Visitor Center area, one from soil around the bottom of a garbage can, one from soil at a center of visitor congregation, and one from a well irrigated lawn in front of the Ranger's stone house. Six samples were taken from the then new campground, three from a camp site in the chaparral, and three from a camp site under a Jeffrey Pine. Of each set of three one came from the front of the stove, one from the more used area near the table, and one from the tent area. The tenth sample was taken from an undisturbed area under pine in the chaparral across the access road from the "A" loop exit lane. Obviously, I was interested in determining the effects of visitor use on the fungus populations, as well as adding species to the list of fungi of the Park.

Unfortunately, one set of samples, taken without replication and during the first year of operation of the campground, did not yield a great deal of information. However, it may be estimated that molds tend to increase as human use of an area increases as long as that use leads to an increase of organic matter of any type in the soil.

TABLE 1.

Lassen Volcanic National Park samples collected Aug. 18, 1957, plated 9-12-62.

Sources and Numbers of Species

Sample	Location	Habitat	Number of Species
12	Lake Helen	Water	5
13		Bottom sediment 10" in lake	5
14		Shore sediment (at water line)	6
15		Wet soil, 10' from shore	5
16		Dry soil, 100' from shore	3
17	Emerald Lake	Water	4
18		Bottom sediment in lake (10" out)	2
19		Shore sediment (at water line)	2
20		Shore sediment with iron oxide	6
21		Damp soil 10' from shore	2

Distribution of Species

Fungus species	Sample Number									
	12	13	14	15	16	17	18	19	20	21
<u>Aspergillus sydowii</u>	*	*	*	*					*	
<u>Aureobasidium pullulans</u>									*	
<u>Candida sp.</u>						*				
<u>Cladosporium cladosporioides</u>	*									
<u>Mucor spp.</u>	*		*							
<u>Penicillium spp.</u>		*	*	*	*	*	*	*	*	*
<u>Penicillium chrysogenum</u>		*		*						
<u>Penicillium janthinellum</u>		*	*	*	*	*				
<u>Phialophora sp.</u>	*		*							
<u>Phoma sp.</u>									*	
<u>Rhodotorula sp.</u>	*					*			*	
Unidentified		*	*	*	*		*	*	*	*

Note: sp., and its plural spp., indicate that one or more species of the indicated category were present but not identified to species.

TABLE 2.

Lassen Volcanic National Park samples collected July 7, 1963, plated Aug. 1963.

2-A. Sources and Numbers of Species and Colonies.

Sample	Source	Number of Species	Number of Colonies	pH
1	Visitor Center, garbage pail (for litter)	26	1000	5.5
2	Early Indian lecture bench	16	250	5.7
3	Lawn at Ranger's home	14	450	6.1
4	Campground, Chaparral, near table	18	565	5.6
5	near stove	20	550	6.5
6	tent area	18	750	6.3
7	Jeffrey Pine, near Table	17	1000	6.1
8	near stove	13	1250	7.4
9	tent area	16	750	7.3
10	Undisturbed area under pine and chaparral	14	650	7.0

Note: Valid conclusions cannot be drawn from one set of samples taken without duplication or replication.

[illegible]

Because of the wide variety of habitats available for fungi in Lassen Volcanic National Park, and because of the number of species of fungi found in neighboring regions, it is estimated that possibly more than 500 species of fungi occur in the Park. Up to now more than two-fifths of this number (270) have been identified, but only about eight week's time have been spent in field work in the Park during eleven different years by the writer. During this time more than 1001 collections have been made of which 617 have been identified. In addition, brief seasonal visits have been made by others, especially Dr. Lee Bonar, University of California, Berkeley, have added to the list. Dr. Donald Kowalski, Chico State University, has listed 53 species of Myxomycetes from the Park. As other trips are made to the Park, with more time available to study additional areas in other seasons, it is hoped that additions will be made to the following list.

Species List

The frequency of observation of the species listed is indicated by collection numbers, in the case of records I have made, or by reference to collections made by others. In neither case is there an indication that a species was sighted once or many times. These frequencies are incomplete since over-abundant collecting would overtax the facilities of my herbarium and of the herbaria of my correspondents, and incontinent collecting would possibly tax unnecessarily the supply of material available in the Park. The observed frequency of occurrence of species is roughly indicated in only a few cases.

The dates of collection of a species are listed here in an attempt to partially establish the phenology of the species. Phenology will vary for each species as the dates of the seasons vary with the snowpack and other meteorological phenomena. While complete phenologic data may be available for certain species in certain years, not enough collections or observations of a species are available over a period of time in the same season or the same locality for a complete presentation of this point for each species. The phenology of a species goes beyond the mere collection of mature material, but, where available, notes will be given.

Constancy of species is indicated only by the series of years listed under the dates of collection. These data are not complete since all species were not collected in all years although in many cases fruit bodies were present.

Data concerning abundance will be given with each species based on the following indices:

- I. Very Abundant
- II. Abundant
- III. Common
- IV. Rare
- V. Very rare

These indices in Roman numerals will be supplemented by a series of indices in Capital letters. One or more combinations of the above numerals and the letters listed below will appear with each species.

- A. On coniferous, woody, substrata.
- B. On broadleaf, woody, substrata.
- C. On herbaceous substrata.
- D. On humus, duff, or litter.
- E. On animals or insects.
- F. On other fungi.
- G. On dung.

If adventitious species exist in the Park it is as a result of reaching the area with an adventitious host. Wind-blown spores, or spores carried by other means, may not necessarily produce adventitious species if a species can become established at a certain station or on a certain substrate or host. This observation, of course, is based on the hypothesis that all species adaptable to a certain set of environmental conditions can eventually be found in many, if not all, of the stations with these conditions. The presence of Aspergillus niger in the fumeroles once used as garbage incinerators in the summit crater of Lassen Peak, may indicate the presence of adventitious species for it is not certain that this fungus can survive throughout the year at this elevation where freezing temperatures may occur throughout part of each day of the year.

Specific geographic distribution will be considered in connection with only a few of the species listed. Most distributions will be indicated in a general or an incomplete manner since Seccardo's Sylloge Fungorum and most monographs consulted for this information list it in a general manner rather than in specific terms. "Widespread" is not as inclusive as "cosmopolitan"; "North America", "United States", "western states", etc., may include two or more states or provinces. It is not intended that any general location designation be used to indicate the widespread occurrence of a species within the area so designated.

Further information is added for most species such as the more important vascular plants associated with the listed collections, usually in the union or storey in which the host or substrate occurs. In many cases only the principal forest trees are listed.

Most of the collections were made by the writer and his wife, Vivian G. Cooke. Many were made in company with Lester D. Bodine and individuals and groups invited by him to accompany us in our search for Lessen fungi, including naturalist staff personnel and other Park personnel. Collections made by others are listed where they have come to my attention through herbarium specimens or isolated literature references.

Partial sets of specimens are filed in herbaria at the University of California, Berkeley; Miami University, Oxford, Ohio; the Department of Plant Pathology, Washington State University, Pullman; and of those who made identifications of specimens reported here.

Specialists who have aided in the identification of ^{certain} ~~over a~~ collections include: Dr. Margaret Barr-Bigelow, University of Massachusetts, Dr. H. W. Bigelow, University of Massachusetts, Dr. Lee Bonar, University of California, Dr. V. Demoulin, Liege, Belgium, Dr. M. B. Ellis, Kew, England,

Dr. J. H. Haines, New York State Museum, Dr. L. Harmsen, Copenhagen, Denmark, Dr. L. Kennedy, University of Alberta, Edmonton, Dr. D. T. Kowalski, Chico State University, Dr. A. E. Liberta, Illinois State University, Dr. J. L. Lowe, New York State College of Forestry, the late Dr. G. W. Martin, University of Iowa, Dr. R. Petersen, University of Tennessee, Dr. P. Ponce de Leon, Field Museum, Chicago, Dr. C. T. Rogerson, New York Botanical Garden, Dr. A. H. Smith, University of Michigan, Dr. H. Thiers, San Francisco State University, Dr. J. Trappe, U. S. Forest Service Laboratory, Corvallis, the late Dr. L. E. Dr. Wehmeyer, University of Michigan, and A. L. Welden, Tulane University.

The system of classification used in the list roughly follows that used by Ainsworth, Sparrow and Sussman (1974a, b). There are slight modifications where I think appropriate.

Systematic List of the Fungi of Lassen Volcanic National Park

Myxomycota

My Myxomycetes

Ceratiomyxomycetidae

Ceratiomyxales

Ceratiomyxaceae

Ceratiomyxa fruticulosa (Muell.) Macbr.

Found on rotting wood of Abies concolor in the Sunflower Flats area.

Collections: 34077; also reported by D. T. Kowalski.

Date: 7-4-63.

Abundance: III, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Cosmopolitan, LVNP.

Myxogasteromycetidae

Physarales

Physaraceae

Fuligo intermedia Macbride.

A fruiting mass about 25 cm. in diameter was found on conifer duff and stones in the Summit Lake area, 6700 ft.

Collection: 34967; also reported by D. T. Kowalski.

Date: 7-3-65.

Abundance: IV, D.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: Africa, Pakistan, North America, LVNP.

Fuligo septica (Linnaeus) Weber.

Found on conifer duff in the Sunflower Flats area, 6000 ft. A large

yellow plasmodium (blob) which probably belonged to this species was found on a pine log in the Menzenita Lake Campground, 6000 ft.

Collection: 34912, 49433.

Dates: 7-2-65, 8-29-74.

Abundance: III, A, D.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Cosmopolitan, LVNP.

Leocarpus fragilis (Dickson) Rostkovius

Found on conifer wood in the Sunflower Flats area.

Collection: 34916; also reported by D. T. Kowalski.

Date: 7-2-65.

Abundance: III, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Cosmopolitan, LVNP.

Physarum alpinum (A. & G. Lister) G. Lister

Physarum auripigmentum Martin

Physarum leucopus Link

Collections: Reported by D. T. Kowalski.

Didymiaceae

Diderma lyallii (Masse) Macbride

Found on an old leaf of Allium validum in a meadow along the Broke-Off Mountain Trail, 7500 ft.

Collection: 33482.

Date: 8-14-62.

Abundance: V, D.

Associates: Meadow herbs and grasses.

Distribution: Sweden, Central Europe, Chile, Western North America, LVNP.

Diderma niveum (Rostafinsky) Macbride
^{afinsky}
~~concolor~~

Two specimens which had matured poorly are assigned doubtfully to this species. They were collected on conifer wood along the trail to Boiling Springs Lake in Warner Valley, and on Abies magnifica bark along the Manzanita Creek road. Identifiable material was found in the Sunflower Flats area on conifer wood, and on Abies magnifica bark in the Summit Lake area. 6-7000 ft.

Collections: 34923, 34977, 37101, 38741; also reported by D. T. Kowalski.

Dates: 7-2-65, 7-3-65, 7-9-66, 8-13-67.

Associates: Abies concolor, Abies magnifica, Pinus contorta var. murrayana,
Pinus jeffreyi.

Distribution: Europe, Michigan, Colorado, Nevada, Alaska south to California, LVNP.

Diderma deplanatum Fries.

Diderma globosum Persoon.

Diderma subcaeruleum Kowalski.

Diderma trevelyani (Greville) Fries.

Collections: Reported by D. T. Kowalski.

Didymium dubium Rostafinsky

Collections: Reported by D. T. Kowalski.

Lepidoderma carestianum (Rabenhorst) Rostafinsky

Collections: Reported by D. T. Kowalski.

Lepidoderma chaillatii Rostafinsky

Found on a branch of Tsuga mertensiana three feet above the ground along the Broke-Off Mountain Trail, 7500 feet.

Collection: 33,481; also reported by D. T. Kowalski.

Date: 8-14-62.

Abundance: III, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Central Europe, Great Britain, Oregon, California, LVNP.

LicealesLiceaceae

Licea castanea Lister.

Licea minimum Fries.

Licea pusilla Schrader.

Collections: Reported by D. T. Kowalski.

Reticulariaceae

Enteridium olivaceum Ehrenberg.

Collections: Reported by D. T. Kowalski.

Reticularia lycoperdon Bulliard

Collections: Reported by D. T. Kowalski.

Lycogala epidendrum (Linnaeus) Fries.

Found on rotting wood of Abies concolor and Pinus jeffreyi in the Sunflower Flats area, 6000 feet.

Collections: 34,061, 34,914.

Dates: 7-4-63, 7-2-65.

Abundance: III, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Cosmopolitan, LVNP.

Cribrariaceae

Cribraria argillacea (Persoon) Persoon

Young material, assignable to this species by Dr. Kowalski, was found on rotting Abies wood in the Boiling Springs Lake area, Warner Valley, 5900 ft.

Collections: 37108; also reported by D. T. Kowalski.

Date: 7-9-66.

Abundance: III, A.

Associates: Abies concolor, Calocedrus decurrens.

Distribution: Europe, South Africa, North America, LVNP.

Cribraria macrocarpa Schreder

Found on rotting conifer wood in the Sunflower Flats area.

Collection: 34934.

Date: 7-2-65.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Europe, Chile, Colombia, Pakistan, Japan, North America, LVNP.

Trichiales

Trichiaceae

Arcyria versicolor Phillips

On conifer wood, Trail to Boiling Springs Lake, Warner Valley; on Tsuga mertensiana along the trail to Terrace Lake from Summit Highway.

Collections: 37080, 38698; also reported by D. T. Kowalski.

Insert after line 20 - Trichiales

Dianemaceae

Calomyxa metallica (Berkeley) Lister

Dianema aggregatum Kowalski

Dianema andersoni Morgan

Dianema corticatum Lister

Margarita metallica (Berkeley) G.W.Martin

Collections: Reported by D. T. Kowalski.

Dates: 7-9-66, 8-11-67.

Abundance: III, A.

Associates: Abies concolor, Abies magnifica, Pinus jeffreyi.

Distribution: Southeastern Europe, Japan, Western North America, LVNP.

Hemitrichia montana (Morgan) Macbride

On conifer wood at Sunflower Flats.

Collections: 34953; also reported by D. T. Kowalski.

Dates: 7-3-65.

Abundance: III, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Switzerland, Colorado, Washington, California, LVNP.

Hemitrichia abietina (Wiegand) G. Lister

Collections: Reported by D. T. Kowalski.

Oligonema schweinitzii (Berkeley) Martin

Collections: Reported by D. T. Kowalski.

Prototrichia metallica (Berkeley) Massee

Collections: Reported by D. T. Kowalski.

Trichia affinis de Bary

Trichia contorta (Ditmars) Rostafinsky

Trichia favoginea (Batsch) Persoon

Trichia pusilla (Hedwig) Martin

Trichia varia (Persoon) Persoon

Collections: Reported by D. T. Kowalski.

StemonitomycetidaeStemonitalesStemonitaceaeComstricha sp.

Old material was collected in the Summit Lake area on old wood.

Collection: 34960.

Date: 7-3-65.

Comstricha nigra (Persoon) Schroeter

On conifer wood in the Summit Lake area.

Collections: 34955.

Dates: 7-3-65.

Abundance: IV, A.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: Cosmopolitan, LVNP.

Comstricha pacifica Macbride in Peck & Gilbert

On Abies concolor wood along the trail to Devil's Kitchen, Warner Valley.

Collections: 37076.

Dates: 7-9-66.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi, Calocedrus decurrens.

Comstricha suksdorfii Ellis & Everhart

In rotten conifer wood in the Sunflower Flats area.

Collections: 34917

Dates: 7-2-65.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Washington, LVNP.

Comstricha flaccida (Lister) Morgan

Comstricha typhoides (Bulliard) Rostafinsky

Collections: Reported by D. T. Kowalski.

Enerthenema papillatum (Persoon) Rostafinski

Collections: Reported by D. T. ~~Ross~~ Kowalski

Lamproderma arcyrioides (Sommerfeldt) Rostafinski

Lamproderma biasperosporum Kowalski

Lamproderma carestiae (Cesati & de Notaris) Meylen

Lamproderma ferrugineum Kowalski

Collections: Reported by D. T. Kowalski

Stemonitis scifera (Bulliard) Macbride

Found on conifer wood in the Sunflower Flats area.

Collections: 34926.

Dates: 7-2-65.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Cosmopolitan, LVNP.

Stemonitis fusca Roth

Stemonitis hyperopta Meylen

Collections: Reported by D. T. Kowalski.

EumycotaMastigomycotina

No species in this subdivision have been reported from the Park to date. Species with motile spores can be expected in any clear water lake or stream in the Park.

ZygomycotinaZygomycetesMucoralesMucoraceaeMucor spp.

A number of isolates of species assignable to this genus have been recovered from samples of water and of shore sediments at the water line from Lake Helen; and from soil samples from near a litter can at the Visitor Center at Manzanita Lake, from soil under a well-used bench near the Visitor Center; from soil in an undisturbed area adjacent to the Manzanita Lake Campground; from soil near the stove and in the tent area in a site in chaparral in the Campground; and from soil near the table, the stove, and in the tent area in a campsite under a Pinus jeffreyi tree in the Campground at Manzanita Lake.

Mucor fragilis Bainier

Isolated from soil samples taken from near a litter can at the Visitor Center; from a lawn in front of the Ranger's residence near the Visitor Center; and from near a table in a campsite in chaparral at the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: III, D.

Associates: Pinus jeffreyi, Ceanothus velutinus, Arctostaphylos patula.

Distribution: Germany, North America, LVNP.

Rhizopus spp.

Isolated from soil samples taken in an undisturbed location near the Manzanita Lake Campground; from near a table, near the stove, and in the tent area in a campsite in chaparral; and from near a table in a campsite under a Pinus jeffreyi tree in the Manzanita Lake Campground.

Syzygites

~~Syzygites~~ megalocarpa Ehrenberg ex Fries

Observed on old fleshy fungus fruit bodies (mushrooms).

Distribution: Europe, North America, LVNP.

Mortierellaceae

Mortierella sp.

Isolated from a soil sample from the tent area in a campsite under a Pinus jeffreyi tree in the Manzanita Lake Campground.

Endogoneaceae

Endogone lactiflusa Berkeley & Broome

Found in soil under conifers along the Mt. Harkness Trail. The receptacle was white and fleshy and was produced by an organism which forms a mycorrhizal association with the host plant.

Collection: 42797, identified by J. M. Trappe.

Date: 7-27-40

Abundance: IV, D.

Associates: Abies magnifica.

Distribution: Europe, New England, California, LVNP.

AscomycotinaHemiascomycetesEndomycetalesSaccharomycetaceaeHansenula sp.

One strain of this yeast was isolated from a slime flux on Quercus kelloggii by Phaff, et al. (1972)

Pichia pastoris (Guilliermond) Phaff

One strain of this yeast was isolated from a slime flux on Quercus kelloggii; and one from a slime flux on Salix sp. by Phaff, et al. (1972).

Date: Summer, 1970.

Abundance: IV, G.

Associates: Salix sp., Quercus kelloggii.

Distribution: France, Hungary, California.

TaphrinalesTaphrinaceaeTaphrina cestanopsidis Jenkins

Forming yellow blisters on evergreen leaves of Chrysolepsis sempervirens on the hill beside the Matteson's home at Mineral, Tehama Co.

Collections: 39239.

Date: 7-2-68.

Abundance: V, B.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Calaveras, Tehama and Siskiyou Cos., Calif., Linn Co., Ore.

Taphrina flectans Mix

Forming witches' brooms on Prunus emarginata, the bitter cherry. The brooms bear leaves which are yellowed and thickened. These diseased leaves and branches die before the healthy ones.

Collection: 34215 (with H. Stanley).

Date: 7-7-63.

Abundance: IV, B.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Western North America, LVNP.

Taphrina occidentalis Ray

Causing an elongation and distortion of infected scales of female cones of alder (Alnus tenuifolia) trees and bushes throughout the Park.

Collections: 16672, 26668, 29589, 30915, 34099, 34999, 37098, 45586; Lee Bonar.

Dates: 7-1-42, 8-18-49, 7-1-50, 7-2-54, 8-18-57, 7-5-63, 7-4-65, 7-9-66,
7-12-72.

Abundance: I, B.

Associates: Alnus tenuifolia, Salix spp., herbs of alder thickets.

Taphrina populi-salicis Mix

Found on leaves of willow (Salix laevigata) at Mineral, Tehama Co.

Collection: E. P. Meinicke.

Date: 1911.

Abundance: V, B.

Associates: Willows, meadow herbs and grasses.

Distribution: British Columbia, Washington, Oregon, California, LVNP.

PlectomycetesEurotialesEurotiaceaeEupenicillium lassenii Paden

Isolated, together with its imperfect state Penicillium lassenii Paden, by an alcohol technique from soil from a mixed conifer stand at about 1200 M between Morgan Springs and Deer Creek Pass, Lassen National Forest, Tehama Co. JWP 69-26 is the TYPE strain.

Collection: JWP 69-26.

Date: 1969.

Abundance: V, D.

Associates: Abies concolor and other conifers.

Distribution: Tehama Co., California.

LoculoascomycetesHemisphaerialesMicrothyriaceaeDothidella janus (Berkeley & Curtis) von HoehnelDothidella castanopsidis Dearness

Commonly causing a leaf spot on shrubs of Chrysolepsis sempervirens in the chaparral in the Menzanita Lake area.

Collections: 26666, 42764.

Dates: 7-1-50, 7-26-70

Abundance: II, B.

Associates: Ceanothus velutinus, Arctostaphylos patula.

Distribution: Florida, Texas, New Mexico, Washington, Oregon, California, LVNP.

DothidealesDothideaceaeMycosphaerella tassiana (de Notaris) Johanssen

Found on dead stems of Lupinus obtusilobus along the Summit Trail; and on dead leaves of Carex eurycarpa along the Shadow Lake Trail below the Summit Highway.

Collections: 29529, 37163.

Dates: 7-1-54, 7-11-64.

Abundance: III, C.

Associates: Pinus albicaulis, Tsuga mertensiana.

Distribution: On more than 51 monocot and 58 dicot hosts, panarctic, LVNP,

PleosporalesHerpotrichiellaceaeBerlesiella sp.

Found along the Manzanita Creek Trail on Arctostaphylos patula, and near Drakesbad along Warner Creek on Populus trichocarpa.

Collections: 39384, 45611.

Dates: 7-12-68, 7-13-72.

LophiostomataceaeLophiostoma caulium var. congregatum (Harkness) Chesters & Bell.

Found on Chrysothamnus nauseosus var. occidentalis on top of Mt. Conard.

Collection: 45531.

Date: 7-10-72.

Abundance: V, B.

Associates: Arctostaphylos nevadensis, Holodiscus microphyllus.

Distribution: California, LVNP.

PlasosporaceaeHerpotrichia coulteri (Pk.) BoseNeopeckia coulteri Peckon Pinus albicaulis

Found along the Summit Trail, and in the Eagle Peak area, as a smothering fungus on needles and branch tips, apparently formed while the branches are buried in the winter snowpack.

Collections: 29525, 42810.

Dates: 7-1-54, 7-28-70.

on Pinus contorta var. murrayana

Found at Summit Lake.

Collections: 34973; Lee Bonar, distributed as California Fungi No. 654.

Dates: 7-8-34, 7-3-65.

on Pinus jeffreyi

Found at Sulphur Works; and at an unstated location.

Collections: 29533; E.E.Morse.

Dates: 7-2-54.

Abundance: II, A.

Associates: All conifers in the Park.

Distribution: Europe, Western North America, California, LVNP.

Herpotrichia juniperi (Duby) PetrakHerpotrichia nigra Hartig~~Neopeckia coulteri~~

Collected in the Park forming brown webs on needles and branches which were covered with snow wherever snow stands long enough to permit development of the fungus.

on Abies concolor

on Abies concolor

Location not specified.

Collector: E. E. Morse

Date: 1928.

on Abies magnifica

Along the King Creek Falls Trail; Paradise Meadows area.

Collections: 29532, 49425.

Dates: 7-1-54, 8-29-74.

on Calocedrus decurrens

Along the trail to Boiling Springs Lake, Warner Valley.

Collection: 37096.

Dates: 7-9-66.

on Tsuga mertensiana

Along the Terrace Lake Trail.

Collection: 42895.

Date: 7-30-70

Abundance: II, A.

Associates: All conifer species in the Park.

Distribution: Europe, Norway, Sweden, Swedish Lapland, Greenland, Iceland, North America, LVNP.

Leptosphaeria vagans Karsten

On old herbage of (1) sedges (Carex sp.) on the east slope of Diamond Peak, and on old herbage of (2) Sitanion jubatum on the shore of Butte Lake.

Collection: (1) Lee Bonar, distributed as California Fungi 1167.

Date: 7-11-62.

Collection: (2) Lee Bonar, distributed as California Fungi 1168.

Date: 7-10-62.

Abundance: IV, C.

Associates: Herbs and grasses of wet and dry meadows.

Distribution: Panarctic, LVNP.

Metasphaeria sepelorum Vleugel

Forming patches of grey tissue on the outer surface of old flowers of Juncus parryi in subalpine and snow-bowl areas along the Summit Trail.

Collections: 25567, 29530.

Dates: 8-27-49, 7-1-54.

Abundance: III, C.

Associates: Abies magnifica, Tsuga mertensiana, Pinus albicaulis.

Distribution: On at least 3 species of Juncus and 1 of Luzula in Iceland, Spitzbergen, Swedish Lappland, Sweden, Wyoming, Washington, Oregon, California, LVNP.

Mycomicrothelia macularis (Massalongo) Keissler

Found on Holodiscus microphyllus on top of Mt. Conard.

Collection: 45528.

Date: 7-10-72.

Abundance: IV, B.

Associates: Chrysothamnus nauseosus var. occidentalis, Arctostaphylos nevadensis.

Distribution: Europe, California, LVNP.

Pleospora permunda (M. C. Cooke) Wehmeyer

On overwintered stems of herbs of the parsley family.

Collection: 33483A.

Date: 8-14-62.

Abundance: IV, C.

Associates: Meadow herbs and grasses.

Distribution: Europe, Asia, southern South America, western North America, LVNP.

Pleospora richtophensis Ellis & Everhart

The stems of Monardella odoratissima and other plants are decayed by fungi like this which fruit on them after the snow melts and before they are completely decomposed. King Creek Meadows area.

Collection: 29534.

Date: 7-2-54.

Abundance: IV, C.

Associates: Herbs and grasses of dry meadows.

Distribution: Iran, Spain, western North America, LVNP.

Pleospora tragacanthae Rabenhorst

Found once on previous year's leaves of Phlox diffusa near Lower Twin Lake.

Collection: Gillett 77.

Date: 7-15-52.

Abundance: V, C.

Associates: Pinus contorta var. murrayana.

Distribution: Europe, Greenland, Tierra del Fuego, western North America, LVNP.

Teichospora pomiformis Karsten

Several species of wood decay fungi attack the woody stems of shrubs like Haplopappus bloomeri. This species produces minute apple-like fruit bodies, which are really double walled perithecia, on the dead wood of old branches.

This material was found along the Summit Trail.

Collection: 29526.

Date: 7-1-54.

Abundance: IV, B.

Associates: Haplopappus bloomeri, Pinus albicaulis.

Distribution: Finland, California, LVNP.

Trematosphaeria heterospora (de Notaris) Winter

Fruiting on dead stems of Lupinus obtusilobus found along the lower part of the Summit Trail.

Collection: 29527.

Date: 7-1-54.

Abundance: IV, C.

Associates: Pinus albicaulis.

Distribution: Italy, California, LVNP.

Sporormiaceae

Sporormia intermedia Auerswald

Found on cow manure near Hat Lake.

Collection: 30396.

Date: 7-22-56.

Abundance: V, G.

Associates: Salix spp., Populus tremuloides.

Distribution: Widespread, LVNP.

Hysteriales

Rhytismataceae

Lophium elatum Greville

Found along the Manzanita Creek Trail on Arctostaphylos patula.

Collection: 39384.

Date: 7-12-68.

Abundance: V, B.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: Europe, North America, LVNP.

Pyrenomyces

Sphaeriales

Amphisphaeriaceae

Apiosporella minimi Wehmeyer

One of the several kinds of decay-producing fungi growing on dead stems of plants. Found on dead stems of Allium validum, the alpine onion, in King Creek Meadows.

Collection: 26663A

Date: 7-1-50.

Abundance: V, C,

Associates: Herbs and grasses of meadows.

Distribution: Wyoming, Mt. Shasta, LVNP.

Physalospora abietina Prillieux & Delacroix

Found once on needles of Abies concolor still attached to the tree, east shore of Manzanita Lake.

Collection: Lee Bonar, Identified by J. W. Groves.

Date: 7-10-62.

Abundance: V, A.

Associate: Pinus jeffreyi.

Distribution: France, California, LVNP.

DiatrypaceaeDiatrypella discoidea M.C.Cooke & Peck var. alni M.C.Cooke

Found on dead branches of Alnus tenuifolia along Reflection Lake and Manzanita Lake.

Collections: 34161, 35073.

Dates: 7-7-63, 7-6-65.

Abundance: IV, B.

Associates: Abies concolor, Salix spp.

Distribution: New York, Carolina, California, LVNP

Diatrypella rimosa Shear

Found in the King Creek Meadows area of Tsuga mertensiana wood.

Collection: 39357.

Date: 7-11-68.

Abundance: IV, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Oregon, California, LVNP

Trichosphaeria solaris (M.C.Cooke & Ellis) Ellis & Everhart

Fruiting on wood of an old log of Abies magnifica in the Winter Sports area.

Collection: 26617.

Date: 7-1-50.

Abundance: IV, A.

Associates: Abies magnifica.

Distribution: Europe, eastern North America, California, LVNP.

HyponycetaceaeHypomyces aurantius (Persoon ex Fries) Tulasne

This genus contains a number of fungi which attack and grow on the fruit bodies of other fungi. This species was found on a large conk of Laetiporus sulphureus, the sulphur polypore or chicken of the woods, which had developed the previous season on Abies magnifica near Twin Lakes. Although immature it was readily identified. Also found on an old unidentified polypore in the Sunflower Flats area.

Collections: 34076, 35038.

Dates: 7-4-63, 7-5-65.

Abundance: IV, F.

Associates: Abies concolor, A. magnifica, Pinus jeffreyi, P. ^{Torta} concolor
var. murrayana.

Distribution: Europe, Cuba, North America, LVNP.

XylariaceaeHypoxydon sp.

Found on rotting wood.

Collection: 34158.

Date: 7-7-63.

Hypoxydon mediterraneum (de Notaris) J.H. Miller

Occurring on dead stems of Ceanothus velutinus where this shrub is smothered by new groves of Abies concolor and other forest trees.

Collections: 34059, 34910.

Dates: 7-4-63, 7-2-65.

Abundance: III, B.

Associates: Arctostaphylos patula, Abies concolor.

Distribution: Widespread, United States, LVNP.

Insert at middle of p. 60:

Ophiostomataceae

Ceratocystis ?pilisera (Fries) C. Moreau

On wood of Populus tremuloides in a small grove on an outcrop above
Paradise Meadows.

Collection: 42931, identified by J. R. Dixon.

Date: 7-30-70.

Abundance: V, B.

Associates: Salix spp., Populus tremuloides.

Distribution: Europe, North America, LVNP.

DiscomycetesPhacidialesRhytismataceae

Bifusella acuminata (Ellis & Everhart) Bonar & W. B. Cooke

Found commonly on dead culms of Juncus parryi in snow pockets in subalpine areas, and near King Creek Meadows, and Summit Lake.

Collections: 26654A, 26659, 26985.

Dates: 7-1-50, 9-26-50.

on Carex breweri

Collections: L. Bodine.

Date: Sept. 1972.

Abundance: III, C.

Associates: Juncus parryi, Carex breweri, snow pocket herbs.

Distribution: On Juncus in Colorado, on Juncus parryi on most of the Cascade peaks, Mt. Shasta, LVNP.

Colpoma crispum (Persoon ex Fries) Saccardo

Found on Populus trichocarpa in the Manzanita Lake area.

Collection: 39387.

Date: 7-12-68.

Abundance: V, B.

Associates: Salix spp., Alnus tenuifolia, Populus trichocarpa.

Distribution: On Abies and Larix in Germany, LVNP.

Elytroderma deformans (Weir) Darker

In addition to being a needle-cast fungus, one which causes the ever-green conifer to lose its leaves prematurely, this fungus causes a type of deformation called "witches' broom". It produces an obvious disease in some Jeffrey pines in the Manzanita Lake area. See Childs, 1968.

Collections: 30024; Lee Bonar.

Dates: 8-18-49, 7-30-55.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Western North America, Georgia, Ontario, LVNP.

Devisomycelles medusa^s (Dearness) Darter

Hypodermella medusa Dearness

A needle-cast fungus found by Dr. Lee Bonar on needles of Pinus jeffreyi.

Collection: Lee Bonar.

Date: 8-18-49.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Colorado, northern California, LVNP.

Hypoderma tunicatum Ellis & Everhart

On Arctostaphylos nevadensis along the King Creek - Devil's Kitchen Trail.

Collection: 45560.

Date: 7-11-72.

Abundance: V, B.

Associates: Abies magnifica.

Distribution: Western North America, LVNP.

Lophodermium decorum Darter

Dr. Lee Bonar found this fungus on leaves of Abies concolor not far from the south boundary of the Park, 4.4 miles south of the Elam Creek bridge near SR-32, Lassen National Forest, Tehama Co.

Collection: Lee Bonar, distributed as California Fungi 901.

Date: 8-22-54.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Montana, Oregon, California, LVNP.

Lophodermium pinastri (Schroeter ex Hooker) Chevalier

on Pinus monticola

Found on fallen needles of trees between Lower Twin Lake and Butte Lake.

Collection: 35040.

Date: 7-5-65.

on Pinus jeffreyi

Found on fallen needles in the Manzanita Lake area.

Collections: 34057, 45612.

Dates: 7-4-63, 7-13-72.

Abundance: III, A.

Associates: Abies concolor, Pinus jeffreyi, Pinus monticola.

Distribution: Europe, India, North America, LVNP.

Clithris crispa (Persoon) Rehm

This fungus grows on dead wood of Abies magnifica and Tsuga mertensiana on which it forms blackened areas on which the inconspicuous boat-shaped fruit bodies are produced. Collected along the King Creek Trail and at Summit Lake.

Collections: 30420, 34981, 37190; L. Bodine.

Dates: 7-22-56, 7-3-65, 7-14-66, Sept. 1972.

Abundance: III, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, Western North America, LVNP.

Gloniella lapponica Karsten

Small black boat-shaped fruit bodies of this fungus are found occasionally on blackened twigs of Arctostaphylos nevadensis along the Summit Trail.

Collection: 26640.

Date: 7-1-50

Abundance: IV, B.

Associates: Pinus albicaulis, Tsuga mertensiana.

Distribution: Lapland, Mt. Shasta, LVNP.

HelotialesHemiphacidiaceaeSarcotrichia balsamiae (Davis)Stegopezizella balsamiae (Davis) Sydow

Found on living needles of Abies concolor in groves in the north portion of the Park 5 miles south of Manzanita Lake along SR-89.

Collection: Lee Bonar.

Date: 7-30-53, 8-21-54.

Abundance: IV, A.

Associates: Pinus contorta var. murrayana, Abies concolor.

Distribution: Ontario, Wisconsin, Oregon, California, LVNP.

DermateaceaeCelloria oleosa (Ellis) Saccardo

Tiny orange cups are formed on dead stems of a member of the parsley family along the Broke-Off Mountain Trail.

Collection: 33483.

Date: 8-14-62.

Abundance: V, C.

Associates: Herbs and grasses of stream-side meadows.

Distribution: California, LVNP.

Cenangium aureum Ellis & Everhart

On dead branches of Ceanothus velutinus, Manzanita Creek Trail above Manzanita Lake, 6500 feet.

Collection: 30903.

Date: 8-17-59.

Abundance: IV, B.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: California, LVNP.

Chlorociboria sp.

Several species in this genus stain the wood in which they grow green.
on Arctostaphylos nevadensis

Green stained wood found on top of Mt. Conard, 8290 ft.

Collection: 45530.

Date: 7-10-72.

on Populus tremuloides

Green stained wood found in the aspen grove above Paradise Meadows.

Collection: 42931

Date: 7-30-70.

Fabrea rousseana Saccardo & Bonner

Found on leaves of Caltha biflora in a mountain meadow.

Collection: Lee Bonar.

Date: 7-8-34.

Abundance: V, C.

Associates: Meadow herbs and grasses.

Distribution: Belgium, California, LVNP.

?Haglundia perelegans Nannfeldt

On Arctostaphylos patula wood, Manzanita Creek Trail.

Collection: 45611.

Date: 7-13-62.

Abundance: V, B.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: California, LVNP.

Mollisia cinerea (Batsch ex Fries) Karsten

One of the less conspicuous cup fungi in the Park is this species which forms small grey cups on wet rotting wood. Found on rotting Abies magnifica wood in the Winter Sports area.

Collection: 26605.

Date: 7-1-50.

Abundance: IV, A.

Associates: Abies magnifica, Alnus tenuifolia, Salix spp.

Mollisia piceae (Persoon) Quélét

On dead attached needles of Abies concolor, east shore of Manzanita Lake.

Collection: Lee Bonar, identified by J. W. Groves.

Date: 7-10-62.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: California, LVNP.

HyaloscyphaceaeDasyscyphus sp.

Immature material of this fungus was found on rotting wood.

Collection: 41268.

Date: 8-18-69.

Dasyscyphus bicolor (Bulliard ex Meret) Fuckel var. bicolor.

This little cup fungus with a white hairy surface and a yellow disc occurs occasionally on dead twigs of most kinds of broad-leaved shrubs and trees.

on Alnus tenuifolia

Found on dead twigs on the Broke-Off Mountain Trail and along the Paradise Meadows Trail.

Collections: 30410, 33487, 34199, 34200, 45583, identified by J.H.Haines.

Dates: 7-22-56, 8-14-62, 7-7-63, 7-12-72.

on Arctostaphylos patula

Found on dead twigs in the Reflection Lake area.

Collection: 35076, identified by R. P. Korf

Date: 7-6-65

on Ceanothus velutinus

Found on dead twigs at Sunflower Flats.

Collections: 34054, 34063, 34064, 34068, 39296.

Dates: 7-4-63, 7-8-68.

on Populus tremuloides

Found on dead twigs, aspen grove above Hat Lake.

Collection: 34193.

Date: 7-7-63

Abundance: III, B.

Associates: Abies concolor, A. magnifica, Pinus contorta var. murrayana,
Pinus jeffreyi.

Distribution: Widespread, California, LVNP.

Desyscyphus serinellus (Quélet) Saccardo

Tiny little yellow cups occur on needles of Tsuga mertensiana in the litter in moist pockets along the Terrace Lake Trail.

Collection: 39327.

Date: 7-10-68

Abundance: IV, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, Mt. Shasta, LVNP.

Desyscyphus succineus (Phillips) Saccardo

Small olive yellow cups were found on twigs of Ceanothus velutinus at Sunflower Flats.

Collection: 34072.

Date: 7-4-63.

Abundance: V, B.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: Colorado, Utah, Mt. Shasta, LVNP.

Desyscyphus virgineus S. F. Gray

on Alnus tenuifolia

Small white cups were found on twigs in the vicinity of Boiling Lake in the Warner Valley.

Collection: 37094.

Date: 7-9-66.

on Populus tremuloides

Found on twigs in the aspen groves above Hat Lake.

Collection: 42934, identified by J. H. Haines.

Date: 7-30-70.

Abundance: IV, B.

Associates: Abies concolor, Calocedrus decurrens, Pinus contorta var.
murrayana, Pinus jeffreyi.

Lechnellula chrysophthalma (Persoon ex Fries) Karsten

on Abies magnifica

A white hairy cup fungus with a yellow disc found only on conifer wood. Found near Bumpass Hell.

Collection: 29557.

Date: 7-2-54.

on Pinus albicaulis

Found along the Summit Trail.

Collection: 26641.

Date: 7-1-50.

Abundance: IV, A.

Associates: Abies magnifica, Pinus albicaulis, Tsuga mertensiana.

Distribution: Europe, North America, Mt. Shasta, LVNP.

Lechnellula agassizii (Berkeley & Curtis)

Dasyscypha agassizii (Berkeley & Curtis) Saccardo

Growing on bark, twigs and wood of Abies magnifica, Tsuga mertensiana, and other conifers, this white cup fungus with a bright yellow disc is found occasionally. It is inconspicuous when dry and folded up. Winter Sports area, Paradise Meadows, King Creek Meadows, Summit Trail.

Collections: 26626, 30306, 34135, 34148A. 34155.

Dates: 7-1-50, 7-22-56, 7-6-63.

Abundance: III, A.

Associates: Abies magnifica, Pinus albicaulis, Pinus contorta var. murrayana,
Tsuga mertensiana.

Distribution: New England, Wisconsin, California, Mt. Shasta, LVNP.

Lechnellula ^{arida} (Phillips) Dennis

This is one of the commoner cup fungi which grow on dead twigs and wood of conifers in the Park. When fresh or wet its dark yellow disc is very showy for it occurs in large numbers. When dry only its brown, hairy, and rather inconspicuous outer surface is all that can be seen.

on Abies concolor

Found in the Sunflower Flats area.

Collection: 34928.

Date: 7-7-65.

on Abies magnifica

Found in the Sifford Lakes area and along the Broke-Off Mountain Trail.

Collection: 30418, 45567, 45585.

Dates: 7-22-56, 7-11-72, 7-12-72.

on Pinus albicaulis

Near upper limit of tree growth on Summit Trail, 9000 ft.

Collection: 26637.

Date: 7-1-50

on Tsuga mertensiana

Near upper limit of growth of this species on the Summit Trail and in the Eagle Peak area, 8700-9000 ft.

Collections: 26632, 42807.

Dates: 7-1-50, 7-28-70.

Abundance: III, A.

Associates: Abies concolor, Abies magnifica, Pinus albicaulis, Pinus jeffreyi, Tsuga mertensiana.

Distribution: Western North America, Mt. Shasta, LVNP.

Trichopezizella reilians var. macrospora (Raitvir) Haines
on Populus tremuloides.

Small white cups were found on dead aspen twigs in the aspen groves above Hat Lake.

Collection: 42935, identified by J. H. Haines.

Date: 7-30-70.

Abundance: V, B.

Associates: Populus tremuloides.

Distribution:

Pezizales

Ascobolaceae

Saccobolus violascens Boudier

This small cup fungus was found on cow dung near Hat Lake.

Collection: 30396.

Date: 7-22-56.

Abundance: V, G.

Associates: Salix spp., Alnus tenuifolia.

Distribution: Europe, North America, LVNP.

Thelebolus stercoreus Tode

This is a small cup fungus found on deer droppings in King Creek Meadows.

Collections: 32556. Sent for identification to Roy F. Cain, University of Toronto and now deposited in the Mycological Herbarium of that institution (TRTC 39172), and in the Cornell University Mycological Herbarium, Dept. of Plant Pathology (CUP 47730).

Date: 7-21-61.

Abundance: V, G.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, New York, California, LVNP.

PyronemataceaeCheilymenia theleboloides (Albertini & Schweinitz) Boudier

A very small cup fungus which fruits on deer droppings and cow dung.

This material was found at Hat Lake.

Collection: 30396.

Date: 7-22-56.

Abundance: V, G.

Associates: Alnus tenuifolia, Salix spp., Populus tremuloides.

Distribution. Europe, North America, LVNP.

Scutellinia scutellata (Linnaeus ex St. Amans) Lambotte

This little scarlet cup fungus fruits on water soaked wood and soil.

The red cup is bordered with a row of black hairs. Found near an Abies concolor log and [^]Salix wood in the former Manzanita Lake Headquarters area, and at Juniper Lake.

Collections: 34108, 41267, 49292.

Dates: 7-5-63, 8-18-69, 8-26-74.

Abundance: IV, D.

Associates: Salix spp., Alnus tenuifolia, Abies concolor, Pinus jeffreyi.

Distribution: Europe, North America, LVNP.

Pezizaceae

Caloscypha fulgens Boudier

Probably the showiest of the spring cup fungi is this species which produces medium sized dark yellow to orange cups on litter and duff in conifer woods. It stains green when bruised or in age. In most years it is found in scattered groups while the ground is still moist from melting snow. In early July, 1965, it was exceedingly common throughout the Park. Those of its relatives which have been tested are edible; however, because it would take a large number of cups to provide a good serving, it has not been tested to my knowledge. Found in the Winter Sports area, Crumbaugh Lake, the Broke-Off Mountain Trail, and observed elsewhere.

Collections: 26614, 29562, 30414, 34985, 34994, 35044, 38728, 45523, 45588.

Dates: 7-1-50, 7-2-54, 7-22-56, 7-3-65, 7-4-65, 7-5-65, 8-12-69, 7-10-72,
7-12-72.

Abundance: I, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, North America, LVNP.

Octospora leucoloma Hedwig ex S. F. Gray

On soil in the Juniper Lake area.

Collection: 41269.

Date: 8-18-69.

Abundance: V, D.

Associates: Salix sp., Abies concolor.

Distribution: Europe, North America, LVNP.

Peziza sylvestris (Boudier) Saccardo & Trotter

Found once on the ground in woods in an unspecified location in the Park.

Collection: E. E. Morse.

Date: 1928.

Abundance: V, D.

Associates: unknown.

Distribution: Europe, North America, LVNP.

Sarcosphaera crassa (Santi ex Steudl) Pouzar

Sarcosphaera eximia (Durieu & Léveillé) Maire

Sarcosphaera amplissima (Fries) Kanouse

Sarcosphaera coronaria (Jacquin) Schroeter

Although this large cup fungus can be expected in conifer woods fairly frequently, it had been found once along the Broke-Off Mountain Trail, and once in the chaparral near the Manzanita Lake Campground, until the spring of 1965 when in early July it was abundant in the Sunflower Flats area. It was again abundant in the Abies concolor grove in this area in July, 1968. It has also been found under Tsuga mertensiana. Its fruit bodies develop just under the surface of the soil and then open up by splitting into a number of ^{star-like} rays, the "crown" of one specific epithet. The flesh is brittle and is translucent, being colored a delicate amethyst with greenish tints. Other colors may develop, or these may intensify on its being bruised. The flesh becomes discolored by adhering particles of dust and dirt,

Collections: 33490, 34114, 34907, 37089, 39298.

Dates: 8-14-62, 7-5-63, 7-2-65, 7-9-66, 7-8-68.

Abundance: III, D.

Associates: Abies concolor, A. magnifica, Pinus jeffreyi, Tsuga mertensiana.

Distribution: Europe, North Africa, North America, LVNP.

Sarcosomataceae

Plectania nannfeldtii Korf

Paxins nigrella Seever

The black cups of this fungus are pushed up above the litter and duff on which they are produced after the snow melts by long black stipes. Found occasionally throughout the Park in conifer woods where snowbanks linger, including the Winter Sports area.

Collections: 26618, 29556, 34975, 39329.

Dates: 7-1-50, 7-2-54, 7-3-65, 7-10-68.

Abundance: III, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Colorado, Cascade Mountains of Oregon and Washington,
Mt. Shasta, LVNP.

Morchellaceae

Morchella angusticeps Peck

This slender stemmed morel, or sponge mushroom, has been found at least once in the Park. The problem of records of morels is reticence on the part of collectors who prefer not to disclose the location of these tasty mushrooms.

Collection: A park naturalist sent a specimen to Miss E. E. Morse.

Date: Autumn, 1933.

Abundance: V, D.

Associates: Specific location not cited.

Distribution: Europe, North America, LVNP.

Morchella esculenta Persoon ex St. Amans

This common morel has been found in the vicinity of Manzanita Lake and along the fire road which follows the old Immigrant Trail near the foundation of a cabin near Badger Flat. In a trail a large specimen 13 cm. tall with a stipe 6 cm. in diameter was also found.

Collections: 35052; L. Bodine, H. Stanley.

Dates: 7-5-65.

Abundance: IV, D.

Associates: Pinus contorta var. murrayana, and others.

Distribution: Europe, North America, LVNP.

Morchella crassipes (Ventenant) Persoon.

A half dozen large specimens which had dried in place were found on litter and duff under Abies concolor in a grove near Sunflower Flats.

Collection: 39297.

Date: 7-8-68.

Abundance: V, D.

Associates: Abies concolor.

Distribution: Europe, North America, LVNP.

Helvellaceae

Discina ancilis (Persoon) Saccardo

One of the few cup fungi associated with important wood decay problems is this large species which fruits on the ground or on wood in late stages of decay almost buried in the ground. Found once between Hat Lake and Paradise Meadows.

Collection: 30409.

Date: 7-22-56.

Abundance: V, D.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: Europe, North America, LVNP.

Disciotis venosa (Persoon) Boudier

This is a large brown cup fungus whose surface is veined more or less distinctly. Specimens found occurred on moist soil near melting snowbanks. The cups had opened so that they were lying flat on the ground. In the process they had become regularly lobed much like a four-lobed shamrock although they were brown in color. Near trail near Shadow Lake and in the vicinity of King Creek Meadows.

Collections: 39328, 39355, 49342.

Dates: 7-10-68, 7-11-68, 8-27-74.

Abundance: IV, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, North America, LVNP.

Helvella sp.

Found in Tehama Co. one mile west of Mineral.

Collection: L. Bodine.

Date: 9-29-69.

Helvella californica Phillips

The California lorchel is the largest Discomycete found to date in the Park. It fruits on wet decayed wood or on the ground near such wood. It is one of the "saddle" fungi, and has been called the "brain" fungus because

of its convoluted surface. Edibility of this species is unknown to the writer. Some species of Helvella are reported to be edible, others have geographic strains known to be poisonous, or at least toxic, to some who have eaten them. Found along the Warner Valley Trail to Devil's Kitchen.

Collections: 37077; Lee Boner; and a second specimen in the Herbarium of the University of California, Berkeley.

Dates: 7-8-34, 7-9-66.

Abundance: IV, D.

Associates: Abies concolor, Calocedrus decurrens, Pinus jeffreyi.

Distribution: Nevada, Oregon, California, LVNP.

Helvella caroliniana (Bosc) Nees

Found once in the Park along the Broke-Off Mountain Trail. Probably toxic but see above.

Collection: 35018.

Date: 7-4-65

Abundance: V, D.

Associates: Abies magnifica.

Distribution: North America, LVNP.

Tuberales

Tuberaceae

Geopora cooperi f. gilkeyae Burdsall

Collected once under Abies concolor in the Manzanita Lake area. This is a large white truffle which fruits underground.

Collection: 49303; identified by J. M. Trappe.

Date: 8-26-74.

Abundance: V, D.

Associates: Abies concolor.

Distribution: Oregon, California, LVNP.

Hydnotria variiformis Gilkey

This is a little white truffle which fruits in or under rotting wood. Apparently the ancestral fruit body started to grow like a cup mushroom, which some specimens resemble, but became contorted and distorted because of the crowded position in the rotting wood or soil. Edibility is unknown since few specimens are found at a time and these are kept by some for study. The fungus has been found at high elevations or just below timberline.

Collections: 37192, 37194, 42831, 49335.

Dates: 7-14-66, 7-28-70, 8-27-74.

Abundance: IV, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Wyoming, Oregon, California, LVNP.

Tuber sp.

Collected once near Mineral, Tehama Co., on the ground under litter in mixed conifer woods.

Collection: L. Bodine.

Date: 8-27-74.

Basidiomycotina

Teliomycetes

Uredinales

Pucciniaceae

Phragmidium ivesiae Sydow

on Potentilla sp.

A specimen was collected at Mineral, Tehama Co.

Collection: The specimen, collected by W. H. Long, is deposited in the
Arthur Rust Herbarium, Purdue University (AH-8400).

Date: 1911.

Abundance: V, C.

Associates: Meadow herbs and grasses.

Distribution: On at least 24 roseaceous species west of the Mississippi
in Canada and the United States, LVNP.

Puccinia amphispilusa Dietel & Holway

on Polygonum newberryi

Reported for LVNP but specimens have not been available for confirmation.

Puccinia caricis (Schumacher) Schroeter

on Carex ?lemonii

Found once at Crumbaugh Lake.

Collection: H. Stanley

Date: 8-28-72.

on Carex multicosta

Found once along the Boiling Springs Lake Trail.

Collection: 37103.

Date: 7-9-66.

on Carex nebraskensis

Found once at Mineral, Tehama Co.

Collection: Mrs. J. Clemens (Arthur Herbarium No. 46133).

Date: 7-30-20.

on Carex specifica

Collected on the Shadow Lake Trail.

Collection: 37164

Date: 7-11-64

on Urtica gracilis var. holosericea

Collected once on nettles at Drakesbad.

Collection: H. E. Parks, specimen at the Herbarium, University of California, Berkeley.

Date: None given.

This rust, which completes its life cycle on two different kinds of host, sedges and nettles, may be found on other sedges in the Park.

Abundance: IV, C.

Associates: Herbs and grasses of wet and dry meadows.

Distribution: On over 100 species of sedges, and on several nettles and gooseberries in temperate Europe, Asia, Japan, New Zealand, North America, LVNP.

Puccinia calcitrapae DeCandolle

Puccinia cireii Lasch

on Cirsium douglasii var. canescens (C. breweri)

Found on Brewer's thistle in a wet meadow at Drakesbad.

Collection: 37087, identified by J. A. Parmelee.

Date: 7-9-66.

Abundance: V, C.

Associates: Meadow herbs and grasses.

Distribution: Widespread on Cirsium, LVNP.

Puccinia gayophyti Arthur

Puccinia vagans de Candolle var. gayophyti Arthur

on Gayophytum spp.

Occasionally many plants in colonies of species of Gayophytum carry the small dark brown pustules of this rust fungus. Found along the Manzanita Creek Trail, and in the vicinity of Hat Lake.

Collections: 30411, 42765.

Dates: 7-22-56, 7-26-70.

Abundance: IV, D.

Associates: Arctostaphylos patula, Ceanothus velutinus, Abies concolor,

Salix spp.

Distribution: On at least seven species of Gayophytum in western North America, LVNP.

Puccinia harknessii Vize

Dicaeoma harknessii (Vize) O. Kuntze

on Stephanomeria lactucina

Collected on plants near Mineral, Tehama Co.

Collection: W. H. Long (Arthur Herbarium 34738, 34739).

Date: 9-12-11.

Abundance: V, C.

Associates: Meadow herbs and grasses.

Distribution: On at least 12 cichoraceous species in the western United States, LVNP.

Puccinia heucherae (Schweinitz) Dietel

on Mitella pentandra

Collected at Drakesbad, Plumas Co.

Collection: J. T. Howell, identified by Lee Bonar, Herbarium, University of California, Berkeley.

Date: 7-23-60.

Abundance: V, C.

Associates: Meadow herbs and grasses.

Distribution: On at least 45 saxifragaceous hosts in Europe, eastern Asia, Japan, North America, LVNP.

Puccinia hieracii (Schumacher) Martius

Bullaria hieracii (Schumacher) Arthur

on Hieracium albiflorum

Found on leaves of most plants of the host in a colony in an opening in fir woods along the trail from Drakesbad to the Devil's Kitchen in 1966, but not observed on that colony in 1975.

Collection: 37078.

Date: 7-9-66.

on Hieracium sp.

Found at Mineral, Tehama Co.

Collection: W. H. Long (Arthur Herbarium 38366)

Date: 9-12-11.

Abundance: IV, C.

Associates: Abies concolor, Calocedrus decurrens, Pinus jeffreyi.

Distribution: On at least 60 cichoraceous species in Europe, Asia, Japan, Africa, Australia, New Zealand, South, Central, and North America, LVNP.

Puccinia menthae Persoon

Dicseoma monardellae (Dudley & Thompson) Arthur

on Monardella odoratissima ssp. pellida.

Found once at Mineral, Tehama Co.

Collection: W. H. Long (Arthur Herbarium 33248, 33249).

Date: Sept. 1911.

Abundance: V, C.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: On at least 50 labiates in Europe, Africa, Asia, Japan,
North and South America, LVNP.

Puccinia monoica (Peck) Arthur

on Arabis platysperma

Most of the host plants observed in the vicinity of the Warner Valley
Campground were parasitized with this rust which forces development of the
bract below the flower, sterilizing the plant. Also found at Hat Lake.

Collections: 37081, 42940.

Dates: 7-9-66, 7-30-70.

Abundance: IV, C.

Associates: Abies concolor, Salix spp.

Distribution: On at least 26 cruciferous species in western United States,
British Columbia, LVNP.

Puccinia mutabilis Ellis & Galloway

on Allium campanulatum

Leaves of a few plants along the Broke-Off Mountain Trail were found
to carry the brown pustules of this fungus.

Collection: 33478.

Date: 8-14-62.

Abundance: V, C.

Associates: Abies magnifica.

Distribution: Western United States.

Puccinia pimpinellae (Strauss) RoehlingDicaeoma pimpinellae (Strauss) O. Kuntzeon Osmorhiza occidentalis Nutt.

Found once near Mineral, Tehama Co.

Collection: W. H. Long (Arthur Herbarium 32302).

Date: Sept. 1911.

Abundance: V, C.

Associates: Abies concolor, Pinus jeffreyi.Distribution: On at least 14 umbelliferous species in Europe, Algeria,
Asia Minor, India, Japan, North America, LVNP.Puccinia plumbariae PeckAllodus galiae (Peck) Ortonon Microsteris gracilis

Found once at Mineral, Tehama Co.

Collection: G. B. Posey (Arthur Herbarium 36164).

Date: 7-31-20.

Abundance: V, C.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Asia, South America, western North America, LVNP.

Puccinia praeegracilis ArthurAecidium graebnerianum Henningson Habenaria (?leucostachys)

Found once at Drakesbad on the rein orchis. It forms yellow aecial pustules on leaves. The alternate host is a species of Agrostis, a grass not yet found in the Park.

Collection: H.E. & S. T. Parks 3327. Identified by Lee Boner (Univ. of California Herbarium).

Date: June 1928.

Abundance: V, C.

Associates: Meadow herbs and grasses.

Distribution: Southern Alaska to Southern California, LVNP.

(Schumacher)
Puccinia violae DeCandolle

Dicaeoma violae (Schumacher) O. Kuntze

on Viola sp.

Found near Mineral, Tehama Co.

Collection: W. H. Long (Arthur Herbarium 32007, 32011).

Date: Sept. 1911.

Abundance: V, C.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Cosmopolitan, LVNP.

Uromyces intricatus M. C. Cooke

on Eriogonum nudum

This rust forms clusters of brown or rust colored pustules on leaves of the host plant which become discolored. Found in the Hot Lake area.

Collection: 42941.

Date: 7-30-70.

on Eriogonum umbellatum

Found in the King Creek Cascades area.

Collection: 29572.

Date: 7-2-54.

Abundance: IV, C.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: On at least 43 polygonaceous species in western North America, LVNP.

Uromyces junci-effusi Sydow

on Juncus howellii Hermann

Collected once in the Park, probably at Summit Lake.

Collection: Bailey 2883 (Arthur Herbarium 56481)

Date: 8-27-48.

Abundance: V, C.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: Distribution: North America, LVNP.

Uromyces spragueae Harkness

on Calyptridium umbellatum

Occasional plants in sandy openings in Warner Valley and along the Manzanita Creek Trail are heavily parasitized by this rust.

Collections: 37104, 42770.

Dates: 7-9-66, 7-26-70.

Abundance: IV, C.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: On 3 species of Calyptridium in Wyoming, Oregon, California, LVNP.

MelampsoraceaeCronartium coleosporioides (Dieter & Holway) Arthur

on Pinus contorta var. murrayana

Occasional on trees in the Warner Valley at Drakesbad where blister galls are formed on the trees.

Collections: 37068, 37092

Dates: 7-9-66.

Abundance: IV, A.

Associates: Abies concolor, Pinus contorta var. murrayana.

Distribution: Central and South America, western North America, LVNP.

Melampsora ribesii-purpurea Klebahn

on Salix Plesandra

Found once on one infected shrub near Hat Lake.

Collection: 49446.

Date: 8-29-74.

Abundance: V, B.

Associates: Salix spp., Alnus tenuifolia.

Distribution: On at least 14 species of Salix in Europe, western Canada, and the United States, LVNP.

Melampsorella caryophyllacearum Schroeter

Melampsorella cerastii (Persoon) Schroeter

on Abies magnifica.

Witches' brooms caused by this fungus have been noted on trees in the King Creek Meadows area, and in Werner Valley. An odor like that of the stink-horn fungus usually accompanies this fungus. Needles on such brooms are covered with rust pustules and usually turn yellow and die prematurely.

Collection: 37125.

Date: 7-11-66.

Abundance: IV, A.

Associates: Abies magnifica.

Distribution: Europe, Siberia, Japan, North America, LVNP.

Pucciniastrum goeppertianum (Kuehn) Klebahnon Abies magnifica

This rust, as is true of many others, requires two kinds of plants on which to grow to complete its life cycle. Both stages have been found in the Park. The aecial cups were found on needles of Abies magnifica near Jakey Lake, while the telial stage has been found on Vaccinium nivicitum at Summit Lake. On dwarf blueberry bushes the fungus grows in the epidermal cells of the stems, swelling them and causing the minute shrub to produce witches' brooms with greatly thickened bark on the elongated branches. Found once on Red Fir at Jakey Lake.

Collection: P. E. Schulz, identified by Lee Bonar (Univ. of California Herbarium).

Date: 9-26-52.

on Vaccinium nivicitum

Forming witches' brooms on small shrubs at Summit Lake.

Collections: 34118, 35042.

Dates: 7-5-63, 7-5-65, 7-10-66.

Abundance: IV, B.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: On at least 12 species of Vaccinium and several conifers in Europe, Japan, Mexico, North America, LVNP.

UstilaginalesUstilaginaceaeAnthracoidea stratae (Saville) Kukkonenon Carex spectabilis

Collected on the shore of Emerald Lake, and at another location in the Park.

Collections: L. Bodine; Lee Bonar, California Fungi 862.

Dates: 8-19-49, Sept. 1972.

Abundance: IV, C.

Associates: Meadow and streamside grasses, sedges, and herbs.

Distribution: British Columbia, Washington, California, LVNP.

"Cintractis caricis" (Persoon) Magnus

on Carex fraxa

Found on plants near Hat Lake.

Collection: 30407.

Date: 7-22-56.

on Carex luzulaefolia

Found on the shore of Emerald Lake.

Collection: Lee Bonar (University of California Herbarium).

Date: 8-19-49.

on Carex spp.

Found in streamside meadows along the Broke-Off Mountain Trail.

Collections: 30919, 30920.

Date: 8-18-57.

Abundance: IV, C.

Associates: Herbs and grasses of wet and dry meadows.

Distribution: On at least 50 cyperaceous species wherever Carex grows,
LVNP.

Sphacelotheca hydropiperis (Schumacher) de Bary

Sphacelotheca inflorescentiae (Trelease) Maire

on Polygonum bistortoides Pursh

Found in a "large wet alpine" meadow near Lassen Volcanic National
Park Headquarters at Mineral, Tehama Co., 6000 ft.

Collection: P. M. Halisky.

Date: 6-10-63.

Abundance: V, C.

Associates: Meadow herbs and grasses.

Distribution: Widespread in North Temperate regions, California.

Ustilago bullata Berkeley

on Bromus carinatus

Occasional on this host throughout the Park; Crumbaugh Lake area.

The seed of the grass is replaced by a mass of black smut spores.

Collections: 30918, 33474; H. Stanley.

Dates: 8-18-57, 8-14-62, 8-28-72.

on Bromus marginatus

Found once in the Hot Lake area.

Collection: 30412.

Date: 7-22-56.

Abundance: IV, C.

Associates: Wet and dry meadow herbs and grasses.

Distribution: On at least 20 species of Bromus in Europe, Asia, Australia, South America, District of Columbia, western North America, LVNP.

Ustilago shastense Zundel

on Polygonum shastense

Found on occasional plants along the lower part of the Summit Trail.

Parts of the flowers, usually anthers, are infected and instead of white or pink or red flowers or fruits, the flowers are turned a dull rose or brownish color with the smut spores in the infected organs.

Collections: 25566, 26983.

Dates: 8-22-49, 9-26-50.

Abundance: IV, B.

Associates: Herbs, grasses and shrubs of subalpine fell fields.

Distribution: Mount Shasta, LVNP.

Ustilago spagazzinii Hirschhorn var. agrestis (Sydow) G.W.Fischer & Hirschhorn.

The wild rye and squirrel tail grasses are parasitized by this smut fungus. The fungus sterilizes the plant, preventing it from producing flowers. It produces black spores on stems under leaf sheaths.

on Elymus glaucus

Found once at the foot of the Broke-Off Mountain Trail.

Collection: 33477.

Date: 8-14-62.

on Sitanion hystrix

Collected throughout the range of the host in the Park; Broke-Off Mountain Trail.

Collections: 30408, 30916, 33476, 38739; J. T. Howell, identified by Lee Bonar, University of California Herbarium.

Dates: 7-22-56, 8-18-57, 8-19-60, 8-14-62, 8-12-69.

Abundance: III, C.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: On at least 22 grass hosts in Europe, Asia, North Africa, North and South America, LVNP.

Ustilago striæformis (Westendorp) Niesel

on Sitanion hystrix.

Found on several plants at a parking area at the foot of the Broke-Off Mountain Trail.

Collections: 33475, 33476A.

Dates: 8-14-62.

Abundance: IV, C.

Associates: Abies magnifica.

Distribution: On many species of grasses in Europe, North America, LVNP.

Heterobasidiomycetes

Dacrymycetales

Dacrymycetaceae

Dacrymyces sp.

Conidial material of a small yellow jelly fungus was found once on rotting conifer wood in the Hat Creek area.

Collection: 34201.

Date: 7-7-63.

Dacrymyces punctiformis Neuhoﬀ

Found occasionally on rotting wood on which it forms small yellow gelatinous pustular fruit bodies. These dry to tiny flecks of yellow which are hardly noticeable. Found along the Summit Trail, and near Jackson Springs, Tehama Co., US-89, 6000 ft.

Collections: 34141, K. Wells 458-3 (University of California Herbarium No. M-201357).

Dates: 5-31-59, 7-6-63.

Abundance: IV, A.

Associates: Abies concolor, Pinus albicaulis, Tsuga mertensiana.

Distribution: Widespread, California, LVNP.

Guepinopsis alpinus (Tracy & Earle) Brasfield

Found on rotting conifer wood as a bright yellow gelatinous fungus which occasionally fruits in great abundance and then colors the wood on which it grows with its own color. When dry, and in dry weather, it is scarcely

noticeable. It is very noticeable on wood irrigated by melting snow.

On conifer wood

Collections: 29536, 37153, 38699, 42781, 42820, 42884.

Dates: 7-2-54, 7-11-64, 8-11-67, 7-27-70, 7-28-70, 7-30-70.

on Abies magnifica wood

Collections: 26616, 26662, 34970, 49326.

Dates: 7-1-50, 7-3-65, 8-27-74.

on Tsuga mertensiana

Collections: 26638, 34129, 45499, 49420.

Dates: 7-1-50, 7-5-63, 7-9-72, 8-29-74.

Abundance: I, A.

Associates: Abies magnifica, Pinus albicaulis, P. monticola, Tsuga mertensiana.

Distribution: Western North America, LVNP.

Tremellales

Tremellaceae

Pseudohydnum gelatinosum (Fries) Karsten

Found inside a rotting log of Abies concolor at Sunflower Flats.

Collection: 34937.

Date: 7-2-65.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Cosmopolitan on coniferous substrata, LVNP.

TulasnellalesTulasnellaceaeTulasnella sp.

Immature material of a species assignable to this genus was found once on rotting conifer wood in the Summit Lake area.

Collection: 34969, identified by A. E. Liberta.

Date: 7-3-65.

Tulasnella violacea Johen-Olsen

This species forms a thin pinkish to lilac colored film over the surface of conifer wood and sticks. It was found once in the Summit Lake area.

Collection: 34978, identified by A. E. Liberta.

Date: 7-3-65.

Abundance: V, A.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: Europe, western North America, LVNP.

HomobasidiomycetesExobasidialesExobasidiaceaeExobasidium vaccinii (Fuckel) Woronin

Many species of shrubs in the heath family are parasitized by this fungus. In Lassen Volcanic National Park, both species of Arctostaphylos, the manzanita, sometimes suffer severe damage because of this fungus. It infects young branches and causes the leaves to turn bright red. Naturally, these branch tips are killed. It has been found rarely at Manzanita Lake on A. patula, and in one year abundantly on A. nevadensis along the upper Broke-Off Mountain Trail, as well as at Paradise Meadows and along the Manzanita Creek Trail.

on Arctostaphylos patula

Collections: L. Bonar, California Fungi No. 890.

Date: 8-21-54.

on Arctostaphylos nevadensis

Collections: 33479, 37110, 42763, 49443.

Dates: 8-14-62, 7-9-66, 7-26-70, 8-29-74.

Abundance: III, B.

Associates: Arctostaphylos patula, Ceanothus velutinus; Abies magnifica,
Tsuga mertensiana.

Distribution: Europe, Siberia, North America, LVNP.

Aphylllophorales

Corticaceae

Several specimens of Corticium, Peniophora, and their segregate genera, have been collected on rotting wood and branches of various conifer and hardwood trees and shrubs in the Park. Many of these cannot be identified to species, or even to genus, because of lack of mature spore-producing structures.

Athelia spp.

Specimens assigned to this genus without going to species because fruiting material was not adequate for additional study, were obtained from dead sticks of Populus tremuloides near Hat Lake, and rotting wood of conifers at Sunflower Flats.

Collections: 34192, 34932, identified by A. E. Liberta.

Dates: 7-7-63, 7-2-65.

Athelia galzini (Bourdot) Donk

Collected on unidentified conifer wood and on wood of Tsuga mertensiana near the Shadow Lake Trail, and in the King Creek Meadow area.

Collections: 37152, 38702, 39344, identified by A. E. Liberta.

Dates: 7-11-64, 8-11-67, 7-11-68.

Abundance: IV, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Sweden, Denmark, California, LVNP

Athelia raunkieri M.P.Christiansen

Found on Abies magnifica wood in the Hat Lake area.

Collection: 34181, identified by A. E. Liberta.

Date: 7-7-63.

Abundance: V, A.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: Denmark, California, LVNP.

Byssocorticium strovirens Bondartsev & Singer ex Singer

Found on rotting conifer wood in the King Creek Meadows area, 7500 feet.

Collection: 39352, identified by A. E. Liberta.

Date: 7-11-68.

Abundance: V, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, California, LVNP.

Corticium curruge Burt

Coniophora corruga Burt

On wood of conifers including Abies magnifica and Tsuga mertensiana at Paradise Meadows, near the Terrace-Paradise-Hat Lakes Trail, along the Broke-Off Mountain Trail, and on conifer wood near Reflection Lake.

Collections: 38703, 39392, 45500, 45582.

Dates: 8-11-67, 7-13-68, 7-9-72, 7-12-72.

Abundance: III, A.

Associates: Abies concolor, A. magnifica, Pinus jeffreyi, T. mertensiana.

Distribution: Washington, California, Arizona, LVNP.

Gloeocystidiellum sp.

Found on Abies magnifica wood along the Broke-Off Mountain Trail.

Collection: 35013, identified by A. E. Liberta.

Date: 7-4-65.

Hyphodontia pallidula (Bresadola) J. Eriksson

Found on Abies concolor wood at Sunflower Flats.

Collection: 34074, identified by A. E. Liberta.

Date: 7-4-63.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Sweden, California, LVNP.

Pellicularia sp.

On rotting conifer wood in the King Creek Meadows area, 7500 feet.

Collection: 39351, A. E. Liberta identification.

Date: 7-11-68.

Pellicularia subcoronata Liberta

On rotting wood of Abies concolor at Sunflower Flats, 6000 feet.

Collections: 34920, 34921, identified by A. E. Liberta.

Dates: 7-2-65.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: California, LVNP.

Peniophora sp.

On rotting wood of Tsuga mertensiana in the King Creek Meadows area.

Collection: 39349.

Date: 7-11-68.

Peniophora filamentosa (Berkeley & Curtis) Burt

On rotting conifer wood at Sunflower Flat.

Collections: 34935, 39318.

Dates: 7-2-65, 7-8-68.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: North America, California, LVNP.

Peniophora incarnata (Persoon ex Fries) Karstⁿ

On dead branches of Arctostaphylos patula in the Sunflower Flats area.

Collection: 34909.

Date: 7-2-65.

Abundance: IV, B.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: Europe, Japan, North America, LVNP.

Peniophora violaceo-livida (Sommerfeldt) Massee (North American form)

On rotting wood of Abies magnifica in the Summit Lake area.

Collection: 34982, identified by A. E. Liberta.

Date: 7-3-65.

Abundance: V, A.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: North America, California, LVNP.

Scytinostroma sp.

Material assigned to this genus was collected on dead wood of Populus tremuloides in a grove above Hat Lake.

Collection: 37129, identified by A. E. Liberta.

Date: 7-11-66.

Trechispora candidissima (Schweinitz) Bondartsev & Singer

This fungus, which looks like a Poria because of the porose hymenial surface, appears to be more closely related to species of corticioid fungi. It has been collected on conifer wood, especially of Abies magnifica in the Hat Lake area.

Collection: 34180.

Date: 7-7-63.

Abundance: IV, A.

Associates: Abies magnifica.

Distribution: North America, LVNP.

Trechispora farinacea (Persoon ex Fries) Liberta

Found on wood of Tsuga mertensiana at Shadow Lake.

Collection: 37157, identified by A. E. Liberta.

Date: 7-11-64.

Abundance: V, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, North America, California, LVNP.

Trechispora vega (Fries) Liberta

On rotting wood of Abies concolor at Sunflower Flats.

Collection: 34060, identified by A. E. Liberta.

Date: 7-4-63.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Europe, North America, LVNP.

Xenasma filicina (Bourdot) M. P. Christensen

On rotting wood, including that of Abies magnifica, at Paradise Meadows and in the King Creek meadows area.

Collections: 34182, 34198, 37135, identified by A. E. Liberta.

Dates: 7-7-63, 7-11-66.

Abundance: IV, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, North America, LVNP.

Meruliaceae

Merulius albostramineus Torrend

Found on rotting conifer wood in the Sunflower Flats area, and on Abies magnifica wood in the vicinity of the Sulphur Works and on the Mount Harkness Trail.

Collections: 26606, 39317, 42782, 42784, identified by J. H. Ginns, Jr.

Dates: 7-1-50, 7-8-68, 7-27-70.

Abundance: III, A.

Associates: Abies concolor, A. magnifica, Pinus jeffreyi.

Distribution: Europe, North America, LVNP.

Merulius tremellosus Fries

Found on rotting wood of Abies concolor on the trail to Boiling Springs Lake, Warner Valley.

Collection: 37106.

Date: 7-9-66.

Abundance: V, A.

Associates: Abies concolor, Calocedrus decurrens, Pinus contorta var. murreyana.

Distribution: Northern Hemisphere, LVNP.

Phlebia albida Fries

On the under side of conifer logs, especially of Abies concolor, A. magnifica and Tsuga mertensiana, is occasionally a fruiting body of this fungus. The lower surface of the resupinate structure is covered with folds in the form of tooth-like projections which become ridges radiating out from many centers. Rather than purely white, the color may range from cream to pale resinous brown. The entire fruit body is fastened tightly to the log in the manner called resupinate, that is, there are no reflexed margins. Sometimes one of these sheets of tissue may be as much as 10 feet (300 cm.) long and cover almost the entire under side of the log.

On unidentified conifer wood: at King Creek Meadows, in the Sulphur Works area, the Sunflower Flats area, and along the Mt. Harkness Trail.

Collections: 29565, 34915, 42795, 45563.

Dates: 7-2-54, 7-2-65, 7-27-70, 7-11-72.

on Abies concolor along the trail to Boiling Springs Lake.

Collection: 37107.

Date: 7-9-66.

on Abies magnifica at the Winter Sports area, and in the Summit Lake area.

Collections: 26613, 34964.

Dates: 7-1-50, 7-3-65.

on Tsuga mertensiana at King Creek Meadows and Crumbaugh Lake.

Collections: 34134, 37191, 39350, 45520.

Dates: 7-6-63, 7-14-66, 7-11-68, 7-10-72.

Abundance: III, A.

Associates: Species of Abies, Pinus and Tsuga.

Distribution: Europe, North America, LVNP.

Coniophoraceae

Coniophora olivacea (Fries) Persoon

Found on Abies magnifica wood along the Manzanita Creek Trail and the Mt. Harkness Trail.

Collections: 42758, 42785, identified by J. H. Ginns, Jr.

Dates: 7-26-70, 7-27-70.

Abundance: IV, A.

Associates: Abies magnifica.

Distribution: Europe, North America, LVNP.

Serpula himantioides (Fries) Bondartsew ex Parmasto

Found on wood of Tsuga mertensiana at King Creek Meadows.

Collection: 34133, identified by J. H. Ginns, Jr.

Date: 7-6-63.

Abundance: V, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, North America, LVNP.

Serpula lacrimans (Persoon ex Fries) Karsten var. lacrimans

Found fruiting on conifer logs forming the walls of a shed and the foundation of a cabin at the Summit Lake Ranger Station. This is one of the common "dry-rot" fungi of structural timber. Because of the habitat it is doubtful if this specimen should be considered distinct from the following

variety.

Collection: 39334.

Date: 7-10-68.

Abundance: V, A.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: Europe, North America, LVNP.

Serpula lacrimans var. shastensis (Harmsen)

Merulius lacrimans var. shastensis Harmsen

Serpula lacrimans var. himantioides (Fries) W. B. Cooke

This fungus grows on such conifer logs as those of Abies magnifica and Tsuga mertensiana. It forms large resupinate patches of bright yellow-brown, nearly gelatinous or almost fleshy tissue which becomes parchment-like when dry. The hymenium on the under surface is formed of a network of veins which make it appear somewhat like a section of a honeycomb. This is probably a "wild" phase of the fungus listed above, a common cause of dry-rot of buildings and structural timbers. Based largely on cultural studies and material from Denmark, Lassen Volcanic National Park, and Mount Shasta, Harmsen () has suggested that the two varieties, himantioides and shastensis, are distinct species. James H. Ginns, Jr., at the Biosystematics Research Institute, Canada Department of Agriculture, recognizes S. himantioides as a distinct species, and has used M. lacrimans var. shastensis in recent identifications.

On Abies magnifica along the upper King Creek Trail, in the Sulphur Works area, along the Paradise Meadows Trail, along the Broke-Off Mountain Trail, along the trail to Boiling Springs Lake, and along the Shadow Lake Trail.

Collections: 29560, 30401, 35008, 35009, 35010, 37082, 37147, 45488, 49408.

Dates: 7-2-54, 7-22-56, 7-11-64, 7-4-65, 7-9-66, 7-9-72, 8-29-74.

on Tsuga mertensiana along the upper Terrace Lake Trail.

Collections: 42908, 45501, 49409.

Dates: 7-30-70, 7-9-72, 8-29-74.

Abundance: III, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Eastern North America, Wyoming, Washington, California,
Mt. Shasta, LVNP.

Porothelaeaceae

Cyphellopsis anomala (Hoffmann ex Fries) Donk

Found on old wood of Salix lasioandra in the thicket behind the Ranger Station at Manzanita Lake, and on dead branches of Populus trichocarpa at Reflection Lake. The fungus fruits as a large colony of small brown cups on the under side of wood or sticks. The cups are brown and hairy and a layer of similar hairs occurs on the wood.

Collections: 34106, 39382.

Dates: 7-7-63, 7-12-68.

Abundance: IV, B.

Associates: Pinus tenuifolia, Populus trichocarpa, Salix spp.

Distribution: Europe, North America, LVNP.

Laehnella eruciformis (Fries) W. B. Cooke

On twigs of Salix sp. in the Hat Lake area.

Collection: 34170.

Date: 7-7-63.

Abundance: V, B.

Associates: Salix spp.

Distribution: Europe, Asia Minor, Western North America, LVNP.

Solenia candida Persoon

On rotting conifer wood in the Sunflower Flats area.

Collection: 34930.

Date: 7-2-65.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Europe, North America, LVNP.

SchizophyllaceaeSchizophyllum commune Fries

The little split-gilled mushroom was found once on Salix twigs in the Manzanita Lake area.

Collection: 34104.

Date: 7-5-63

Abundance: V, B.

Associates: Salix spp., Alnus tenuifolia.

Distribution: Cosmopolitan, LVNP.

StereaceaeAleurodiscus amorphus (Persoon) Rabenhorst ex M. C. Cooke

Small pink cup-like fruit bodies are formed on the underside of twigs and branches of Abies concolor where it was found in the Nobles' Immigrant Pass area.

Collection: 30018.

Date: 7-30-55.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Europe, North America, LVNP.

Aleurodiscus diffusus (Saccardo) Burt

Dead branches of Arctostaphylos patula, the green manzanita, occasionally are rotted by this fungus which produces brown effuse fruit bodies on them. King Creek Cascades, and the Reflection Lake area.

Collection: 29538, 35075, 49293.

Dates: 7-2-54, 7-6-65, 8-26-74.

Abundance: IV, B.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: Only on ericaceous hosts: Manchuria, Siberia, Oregon, Mt. Shasta, LVNP.

Stereum hirsutum (Willdenow ex Fries) S. F. Gray

Found on dead branches of broad-leaved trees and shrubs. On the alder it is found on dead stubs left when cutting trails through thickets.

on Alnus tenuifolia, Trail to Boiling Springs Lake, Warner Valley, Lily Pond Trail, Hat Lake area, around Manzanita Lake, and Broke-Off Mountain Trail.

Collections: 34157, 34186, 35005, 37099, 39383, 45584, 49368.

Dates: 7-7-63, 7-4-65, 7-9-66, 7-12-68, 7-12-72, 8-28-74.

on Arctostaphylos patula, around Reflection Lake and Manzanita Lake.

Collections: 35074, 39380.

Dates: 7-6-65, 7-12-68.

on Populus tremuloides, above Hat Lake.

Collections: 34190, 37130.

Dates: 7-7-63, 7-11-66.

on Populus trichocarpa, around Manzanita Lake.

Collections: 39379, 39385.

Date: 7-12-68.

on Salix sp., around Manzanita Lake.

Collection: 34115.

Date: 7-5-63.

Abundance: III, B.

Associates: Alnus tenuifolia, Arctostaphylos patula, Populus tremuloides,
P. trichocarpa, Salix spp.

Distribution: Europe, North America, LVNP.

Note: Some of the reported collections were determined by, or confirmed
by, A. L. Welden.

Stereum rugisporum (Ellis & Everhart) Burt

On the ends and sides of pieces of conifer ⁰logs this fungus forms small to large masses of brackets projecting from sheets of brown, smooth tissue. The under surface, where the spores are produced on a smooth hymenium, is smooth and purplish brown when fresh. The upper surface is covered with a brown, felt-like tissue which may be zoned. These zones may indicate seasons of growth, a new zone being added each growing season, not necessarily each year,

On old conifer logs, King Creek Meadows, Shadow Lake Trail, Terrace Lake Trail.

Collections: 34137, 37142, 38708.

Dates: 7-6-63, 7-11-64, 8-11-67.

On Abies concolor, along the lower part of the Manzanita Creek Trail.

Collection: 30902.

Date: 7-18-57.

on Abies magnifica, along the Manzanita Creek Trail, 7200 ft.

Collection: 42750.

Date: 7-26-70.

on Pinus contorta var. murrayana, in the King Creek Meadows area.

Collection: 49324.

Date: 8-27-74.

on Pinus monticola, between Summit Lake and Echo Lake.

Collection: 34120.

Date: 7-5-63.

on Tsuga mertensiana, along the upper part of the Terrace Lake Trail,
King Creek Meadows, Broke-Off Mountain Trail,
Bumpass Mountain Trail.

Collections: 29564, 30398, 33484, 39325, 42906, 42839, 45487.

Dates: 7-2-54, 7-22-56, 8-14-62, 7-10-68, 7-28-70, 7-30-70, 7-9-72.

Abundance: III, A.

Associates: Most conifers in the Park.

Distribution: Western North America, LVNP.

Stereum sanguinolentum (Albertini & Schweinitz ex Fries) Fries

This "bleeding" fungus fruits on dead branches of Alnus tenuifolia which it may have killed. Reflection Lake Trail.

Collection: 35077.

Date: 7-6-65.

Abundance: V, B.

Associates: Alnus tenuifolia, Salix spp.

Distribution: Europe, North America, LVNP.

Thelephoraceae

Thelephora sp.

Found once on conifer wood, Sunflower Flats.

Collection: 34919.

Date: 7-2-65.

Thelephora terrestris Ehrenberg ex Fries

Found surrounding young trees of Pinus contorta var. murrayana at the ground line in the Nobles' Immigrant Pass area.

Collection: 38678, 38679.

Dates: 8-10-67.

Abundance: V, A.

Associates: Abies concolor, Pinus contorta var. murrayana

Distribution: Europe, North America, LVNP.

HymenochaetaceaeHymenochaete arida (Karsten) Saccardo

Found on dead branch bases of Ceanothus velutinus in situ in an area where the silver tip fir, Abies concolor, was crowding out the chaparral. The fungus produces a yellow stain in the wood. Sunflower Flats.

Collection: 34069.

Date: 7-4-63.

Abundance: V, B.

Associates: Arctostaphylos patula; Abies concolor, Pinus jeffreyi.

Distribution: Finland, Sweden, Vermont, New York, South Carolina, Michigan, California, LVNP.

GomphaceaeRamaria formosa (Fries) Quélét

Found under firs along the Broke-Off Mountain Trail, under hemlocks near King Creek Meadows, in cinder fields near Cinder Cone, and under firs near Crumbaugh Lake. The fungus was fruiting mostly underground, with only the top of a large fleshy coral-like fruit body showing through the needles in the litter and duff on the ground.

Collections: 35021, 38730, 45521, 45575.

Dates: 7-4-65, 8-12-69, 7-10-72, 7-12-72.

Abundance: IV, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, North America, LVNP.

Echinodontiaceae

Echinodontium tinctorium (Ellis & Everhart) Ellis & Everhart

Large conks or brackets of this Indian Paint Fungus have been found on standing and fallen logs of Abies concolor in the Warner Valley Camp-ground area and at Sunflower Flats.

Collections: 37121, 39308.

Dates: 7-10-66, 7-8-68.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi, Pinus contorta var. murrayana.

Distribution: Western North America, LVNP.

Mucronoporeaceae

Phellinus ferreus (Persoon) Bourdot & Galzin

Relatively thin brown fruit bodies adhere closely to the under side of some conifer logs. On logs of Abies magnifica and Tsuga mertensiana large masses of sterile brown felt may be found which are occasionally associated with the thin brown fruit bodies of this fungus. Broke-Off Mountain Trail, Terrace Lake Trail.

Collections: 33485, 38710, 45508.

Dates: 8-14-62, 8-11-67, 7-9-72.

Abundance: IV, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, North America, LVNP.

Phellinus igniarius (Linnæus ex Fries) QuélétFomes igniarius var. populinus Neuman

The false tinder conk grows on various kinds of hardwood trees and shrubs. Larger typical conks have been found on willow along Menzanita Lake, and on cottonwood along Warner Creek near the Campground. Smaller conks sometimes assigned to the variety cited above are common on aspen in groves above Hat Lake and near the Hot Rock.

on Populus tremuloides

Collections: 24202, 26665, 37126, 38694, 42936; E.E.Morse.

Dates: 1928, 7-1-50, 7-11-66, 8-11-67, 7-30-70.

on Populus trichocarpa

Collection: 37113.

Date: 7-10-66.

on Salix sp.

Collections: 34105, 35072, 45482.

Dates: 7-5-63, 7-6-65, 7-9-72.

Abundance: III, B.

Associates: Alnus tenuifolia, Populus tremuloides, P. trichocarpa, Salix spp.

Distribution: Widespread, LVNP.

Phellinus nigrolimitatus (Romell) Bourdot & Galzin.

Developing in or under old logs, some of which have lain on the ground so long that depressions have formed under them, are fruit bodies of this fungus. They produce deep layers of tubes which are added to seasonally, or year after year, and which may have a black line separating the tubes from the thin context. The fruit body usually appears resupinate, although a narrow, bracket-like pileus may be formed.

on Tsuga mertensiana throughout its range in the Park.

Collections: 29568, 30416, 35002, 37144, 37196, 38707, 39330, 39341,
42814, 42911, 45495, 49332, 49417.

Dates: 7-2-54, 7-22-56, 7-4-65, 7-11-66, 7-14-66, 8-11-67, 7-10-68,
7-11-68, 7-28-70, 7-30-70, 7-9-72, 8-27-74, 8-29-74.

Abundance: III, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, North America, LVNP.

Ganodermataceae

Ganoderma applanatum (Persoon ex Wallroth) Petouillard

A large specimen of the Artist's Conk or Picture Conk was found on a log of Pinus jeffreyi along the trail (6000 ft.) above Drakesbad to Devil's Kitchen, Plumas Co. A second one was found on Abies concolor in a mixed conifer forest at the edge of Battle Creek Meadows near Mineral (5000 ft.), Tehama Co. The latter conk measured 73 x 33 x 10 cm in 1974, and 79 x 34 x 11 cm. in 1975.

Collection: 37120, 49370.

Dates: 7-10-66, 8-28-74.

Abundance: IV, A.

Associates: Abies concolor, Calocedrus decurrens, Pinus lambertiana, P. jeffreyi.

Distribution: Cosmopolitan, LVNP.

Ganoderma lucidum (Leyss ex Fries) Karsten

Found on a Pinus jeffreyi snag standing in Sunflower Flats, 6000 ft., and on buried conifer wood in a forest on Battle Creek Meadows Ranch near Mineral, Tehama Co., 5000 ft.

Collections: 39309, 49356.

Dates: 7-8-68, 8-28-74.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi, P. lambertiana.

Distribution: Widespread, LVNP.

Ganoderma oregonense Murrill

On rotting wood, stumps, or at the base of living trees of Abies concolor, Abies magnifica, and Tsuga mertensiana, the large fruit bodies of the Oregon lacquered conk are found occasionally, although evidence of the decay produced by the fungus is observed more frequently. Among the larger fungus fruit bodies found in the Park are representatives of this species. It is rivaled in size only by fruit bodies of G. applanatum and Laetiporus sulphureus. Fruit bodies of this fungus were found on two fir stumps along a lane at Summit Lake after the end of the 1950 season. The largest conk found was along the Broke-Off Mountain Trail in the summer of 1962. It measured 21 x 14 x 6 inches (52.5 x 35 x 15 cm.). Another conk was found on an Abies concolor stump on the slope above the Matteson's cottage above Mineral in 1974. The fruit body is usually annual, it develops a thick red varnished crust behind the growing edge, and after its growth in the season in which it was developed it may be quickly eaten by beetles and may be parasitized by other fungi.

Collections: 26978, 26979, 33480, 41276, 49280A.

Dates: 9-26-50, 8-14-62, 8-18-69, 8-25-74.

Abundance: IV, F.

Associates: Abies concolor, Abies magnifica, Pinus jeffreyi, Tsuga mertensiana.

Distribution: Western North America, LVNP.

Polyporaceae

Aurantiporellus alboluteus (Ellis & Everhart) Murrill

This fungus produces medium to large fruit bodies on the lower and under side of logs of Abies magnifica and Tsuga mertensiana, and possibly logs

of other conifers near snowbanks. The tubes in which the spores are produced are among the larger found in the pore fungi. Above the tubes is a mass of spongy tissue which forms a sort of pileus on an otherwise resupinate fruit body. The fruit body is reddish orange in color, bordered with white,. It is soon eaten by small beetles after the snow melts and is not easy to preserve. It is soft, spongy, and a beautiful species which, partly because of its purple color in KOH has been placed in Hapalopilus.

Collections: 26655, 30400, 34122, 34968, 42877, 49416.

Dates: 7-1-50, 7-22-56, 7-5-63, 7-3-65, 7-30-70, 8-29-74.

Abundance: III, A.

Associates: Abies magnifica, Pinus albicaulis, Tsuga mertensiana.

Distribution: Czechoslovakia, New York, western United States, LVNP.

Bjerkandera edusta (Willdenow ex Fries) Karsten

This was found fruiting on a stump of Populus trichocarpa along Warner Creek. Trees damaged by beavers are quickly invaded by fungi like this.

Collection: 37097.

Date: 7-9-66.

Abundance: V, B.

Associates: Populus trichocarpa, Salix spp.

Distribution: Widespread, LVNP.

Coltricia perennis (Linnaeus ex Fries) S. F. Gray

This little brown polypore looks like a mushroom growing on the ground, usually among mosses. It has been found in wet places under firs and alders. It is rather woody and is not edible. Broke-Off Mountain Trail, Trail to King Creek Falls, Juniper Lake, and Terrace Lake Trail.

Collections: 30914, 33494, 37195, 38726, 41270, 42857, 45592, 49412.

Dates: 8-18-57, 8-14-62, 7-14-66, 8-12-67, 8-18-69, 7-29-70, 7-12-72,
8-29-74.

Abundance: III, D.

Associates: Alnus tenuifolia, Abies magnifica, Tsuga mertensiana.

Cryptoporus volvatus (Peck) Hubbard

This fungus fruits on the bark and wood of standing or of recently fallen trees of Abies magnifica, Pinus contorta var. murrayana, and probably other conifers in the Park. Small beetles carry the spores from one fruit body to the bark of another tree, burrow into the bark, crawl around the inner bark which they eat, and in their tunnels or the cambium this fungus then develops. The fungus apparently grows faster than the beetles work and eventually girdles and kills the tree. During the time it lives in the tree it produces fruit bodies in the spring. These may be eaten by other insects or may last until the next spring. It is said that the fruit bodies of this fungus are eaten in Asia. It is rather tough and has a resinous odor, although a recent Russian paper describes the odor as like that of vodka.

Collections: 29566, 30393, 33486, 34961, 35046, 37187, 38723, 42783, 49423.

Dates: 7-2-54, 7-22-56, 8-14-62, 7-3-65, 7-5-65, 7-14-66, 8-12-69, 7-27-70,
8-29-74.

Abundance: III, A.

Associates: All conifers in the Park.

Distribution: Siberia, Japan, North America, LVNP.

Gloeophyllum sepiarium (Wulfen ex Fries) Karsten

This brown polypore with gills rather than tubes on the under side, has been found on decaying conifer wood in the Summit Lake area.

Collection: 34957

Date: 7-3-65.

Abundance: V, A.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: North temperate regions, LVNP.

Fomitopsis pinicola (Swartz ex Fries) Karsten

Conks, brackets, or fruit bodies produced by this fungus are found on dead logs of most of the conifers in the Park including Abies concolor, Abies magnifica, Pinus jeffreyi, and Tsuga mertensiana. The type of rot it produces can be determined easily so that the occurrence can be told without its conk. This is a brown cubical rot. It is a fungus which produces perennial fruit bodies to which layers of new growth are added each season or year of growth. In typical specimens a red varnish is produced just behind the rapidly growing edge, giving it the name "red belt conk". This is not to be confused with the red lacquer of the Ganoderma mentioned above. Fruit bodies may be distorted as a result of position or conditions of growth.

Collections: 29570, 30036, 30395, 34071, 37088, 39339, 49364, 49418.

Dates: 7-2-54, 7-31-55, 7-22-56, 7-4-63, 7-9-66, 7-11-68, 8-28-74, 8-29-74.

Abundance: II, A.

Associates: Abies concolor, A. magnifica, Pinus jeffreyi, Tsuga mertensiana.

Distribution: Temperate regions, LVNP.

Heterobasidium annosum (Fries) Brefeld

Although the conks of this fungus have been found on rotting wood of Abies concolor and A. magnifica, it is usually found as a serious root decay producing fungus. In culture this fungus produces an unusual imperfect spore state setting it apart from other species usually placed in the genus Fomitopsis. King Creek Meadows, Battle Creek Meadows Ranch, Tehama Co.

Collections: 34144, 49357.

Dates: 7-6-63, 8-28-74.

Abundance: IV, A.

Associates: Abies concolor, A. magnifica, Calocedrus decurrens, Pinus lambertiana, Tsuga mertensiana.

Distribution: Northern hemisphere, LVNP.

Hirschioporus abietinus (Fries) Donk

This fungus is a common cause of sapwood rot in conifers. In many dry mountain habitats it does not produce typical fruit bodies. This is true of those specimens found on Abies magnifica in the Park. In 1968 more typical specimens were found on Tsuga mertensiana. It forms large masses of small, thin, light colored brackets which may have a purplish tinge.

Collections: 26643, 29563, 34119, 35001, 37148, 38700, 39342, 42848, 45504, 45506, 49322; H. Stanley.

Dates: 7-1-50, 7-2-54, 7-5-63, 7-4-65, 7-11-66, 8-11-67, 7-11-68, 7-28-70, 7-9-72, 8-27-74.

Abundance: II, A.

Associates: Abies concolor, A. magnifica, Tsuga mertensiana.

Distribution: On conifers of the northern hemisphere, LVNP.

Hirschioporus laricinus (Kersten) Teramoto

Found once on Pinus lambertiana in the Nobles' Immigrant Pass area.

Collection: 49310.

Date: 8-26-74.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi, P. lambertiana.

Distribution: Western hemisphere, LVNP.

Inonotus dryadeus (Persoon ex Fries) Murrill

Found once on Pinus ponderosa at Mineral, Tehama Co.

Collection: L. Bodine (WBC 41545).

Date: 9-29-69.

Abundance: V, A.

Associates: Abies concolor, Pinus ponderosa.

Distribution: Europe, North America, LVNP.

Ischnoderma resinosa (Schrad. ex Fries) Karsten

A conk of this fungus was found on an Abies concolor log on the trail from Manzanita Lake to Loomis Creek. This fungus forms large subfleshy conks which are very watery and last for only one season.

Collection: 30901.

Date: 8-17-57.

Abundance: V, A.

Associates: Abies concolor, Pinus ponderosa.

Distribution: Northern Hemisphere, LVNP.

Laetiporus sulphureus (Fries) Bondartsev & Singer

A large mass of the previous year's growth of this fungus was found on an Abies magnifica snag near Lower Twin Lake in the early part of July, 1965. When fresh the fungus is fleshy and bright sulphur yellow. In this condition it is edible. After overwintering it turned chalky white. Where it was parasitized by Hypomyces gaurantius the red stroma of the parasite colored it.

Collection: 35038A.

Date: 7-5-65.

Abundance: V, A.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: Cosmopolitan, LVNP.

Laricifomes officinalis (Villars ex Fries) Kottele & Pouzar

Relatively small conks of this fungus have been found on rotting conifer logs, possibly of fir. Others were found on logs of Tsuga mertensiana and of Abies concolor. A large conk was found on Pinus contorta var. murrayana at King Creek Meadows. The large content of polyporic acid gives it the name "Quinine conk", and once made it useful for pharmaceutical purposes. It is no longer in demand for this use, to my knowledge.

Collections: 34984, 39340, 45519, 49280, 49204.

Dates: 7-3-65, 7-11-68, 7-10-72, 8-25-74, 8-26-74.

Abundance: IV, A.

Associates: Abies concolor, A. magnifica, Pinus contorta var. murrayana,
P. jeffreyi, P. ponderosa.

Distribution: Western North America, LVNP.

Phaeolus schweinitzii (Fries) Patouillard

Found on a stump of Pinus ponderosa at Mineral, Tehama Co., and on a stump of Pinus contorta var. murrayana at Drakesbad.

Collections: 45570; L. Bodine (WBC 42624).

Dates: May, 1970, 7-11-72.

Abundance: IV, A.

Associates: Pinus contorta var. murrayana, Pinus ponderosa, Abies concolor.

Distribution: Europe, North America, LVNP.

Polyporus elegans Bulliard ex Fries

Medium sized woody mushroom-like growths are produced by this fungus on wood of Salix spp. and of Alnus ^{tenuifolia} ~~incana~~ in the Manzanita Lake, Reflection Lake, and Sulphur Works areas.

Collections: 29571, 34102, 39391.

Dates: 7-2-54, 7-5-63, 7-13-68.

Abundance: IV, B.

Associates: Alnus tenuifolia, Salix spp.

Distribution: Europe, North America, LVNP.

Polyporus squamosus Hudson ex Fries

Found on dead wood in a willow grove near the Manzanita Lake Ranger Station were small mushroom-like fruit bodies of this species.

Collection: 38695.

Date: 8-11-67.

Abundance: IV, B.

Associates: Salix spp.

Distribution: Northern Hemisphere, LVNP

Poria johnstonii Murrill

A small white resupinate polypore, this species was found on wood of Tsuga mertensiana in subalpine areas.

Collection: 39345, 45497, 49415.

Date: 7-11-68, 7-9-72, 8-29-74.

Abundance: IV, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: California, LVNP.

Spongiporus leucospongia (M. C. Cooke & Harkness) Murrill

Wherever conifer wood is found rotting on the ground, especially where it has been buried under the snow during most of the winter, this fungus is found. It forms white spongy fruit bodies with hard pore-bearing areas on the sides and ends of logs of Abies magnifica, Pinus contorta var. murrayana, P. monticola, and Tsuga mertensiana. This fungus can be very troublesome

Insert line 12, p. 121.

Poria cocos Wolf

Fungus material collected on a log of Tsuga mertensiana along the Terrace Lake trail has been identified as sclerotial material of this species.

Collection: 45501, identified by J. H. Ginns, Jr.

Date: 7-9-72.

Abundance: V, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: North America, LVNP.

on logs which are used as bumpers and markers in parking lots and along roadways, since it quickly rots them making them useless.

Collections: 26625, 26653, 29561, 30403, 30413, 30912, 34051, 34124,
34126, 34127, 34146, 34154, 34976, 35050, 37070, 37123, 37141,
37186, 38701, 39331, 39343, 42792, 42828, 42829, 42838,
42846, 42914, 45490, 45568, 45593, 49325, 49422.

Dates: 7-1-50, 7-2-54, 7-22-56, 8-18-57, 7-4-63, 7-6-63, 7-3-65, 7-9-66,
7-10-66, 7-11-66, 7-12-66, 8-11-67, 7-10-68, 7-11-68, 7-27-70,
7-28-70, 7-30-70, 7-9-72, 7-11-72, 7-12-72, 8-27-74, 8-29-74.

Abundance: I, A.

Associates: All conifers of montane and subalpine regions, LVNP.

Distribution: Western North America, LVNP.

Tyromyces caesius (Schrader ex Fries) Murrill

Found once on a log of Abies magnifica. This small polypore is bluish, or turns blue when bruised. Found near the Warner Campground.

Collection: 37118.

Date: 7-10-66.

Abundance: V, A.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: Europe, North America, LVNP.

Agaricales

Hygrophoraceae

Hygrophorus spp.

Two unidentified species of Hygrophorus were collected near Mineral in the autumn of 1967 and 1969.

Collections: J. Richardson, L. Bodine.

Dates: Autumn 1967, 9-29-67.

Hygrophorus erubescens (Fries) Fries var. erubescens

Found at about 7500 ft. along the Broke-Off Mountain Trail.

Collection: 33510.

Date: 8-14-62.

Abundance: V, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Europe, North America, LVNP.

Hygrophorus goetzii A. H. Smith

This beautiful pink to rose colored mushroom grows commonly on litter and duff near melting snowbanks on most of the Cascade Peaks in alpine and sub-alpine areas. The cap is coated with a layer of slimy material which is thick when the mushroom is fresh, and becomes dry as the mushroom dries out in place. The mushroom may grow up through the snow when the snowbank is melting away.

Collections: 29555, 34052, 34132, 34987, 37124, 38712, 39322, 42777,
42841, 42915, 45513, 45541, 45598, 49343.

Dates: 7-2-54, 7-4-63, 7-6-63, 7-3-65, 7-10-66, 8-11-67, 7-10-68, 7-27-70,
7-28-70, 7-30-70, 7-9-72, 7-10-72, 7-12-72, 8-27-74.

Abundance: I, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Cascade Mountains, LVNP.

Hygrophorus ?russula (Fries) Quélet

Found under firs along the Broke-Off Mountain Trail.

Collection: 45606.

Date: 7-10-72.

Abundance: V, D.

Associates: Abies magnifica.

Distribution: Europe, North America, LVNP.

Hygrophorus subalpinus A. H. Smith

Found along the Broke-Off Mountain Trail under firs and hemlocks.

Collections: 38729, 45607.

Dates: 8-12-69, 7-12-72.

Abundance: IV, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Western United States, LVNP.

TricholomataceaeCollybia bakerensis A. H. Smith

This small mushroom, produced on conifer bark, is found occasionally near stumps and logs of Abies concolor, A. magnifica and Tsuga mertensiana where moisture is retained long after the snow melts. The stipes are pinkish to reddish while the caps are white and only one or two centimeters across. It was first found on Mt. Baker and has since been found on Mt. Shasta and in Lassen Volcanic National Park.

Collections: 26648, 34089, 34205, 34940, 37156, 39360, 42796, 42894, 49421.

Dates: 7-1-50, 7-4-63, 7-7-63, 7-3-65, 7-11-67, 7-11-68, 7-27-72, 7-30-72,
8-29-74.

Abundance: II, A.

Associates: Abies concolor, A. magnifica, Tsuga mertensiana.

Distribution: Washington, California, LVNP.

Clitocybe sp.

Found on litter and duff on the ground under Abies magnifica and Tsuga mertensiana at King Creek Meadows and along the Broke-Off Mountain Trail.

Collections: 33504, 34445, identified by H. E. Bigelow.

Dates: 8-14-62, 7-6-63.

Clitocybe albirhiza Bigelow & A. H. Smith

On and under Abies concolor duff at Manzanita Lake and Sunflower Flat.

Collections: 34085, 35078, Identified by H. E. Bigelow.

Dates: 7-4-63, 7-5-65.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Western United States, LVNP.

Collybia sp.

Found once at Sunflower Flats.

Collection: 34093, identified by H. E. Bigelow.

Date: 7-4-63.

Laccaria laccata (Scopoli ex Fries) Berkeley & Broome

Small specimens were found in a small moist meadow in a fir (Abies concolor) grove near the Chaos Jumbles at Nobles' Immigrant Pass.

Collections: 38691, 49309.

Dates: 8-10-67, 8-26-74.

Abundance: IV, D.

Associates: Abies concolor, Pinus ^{contorta var.} murrayana, meadow grasses and herbs.

Distribution: Europe, North America, LVNP.

Lentinellus montanus O. K. Miller

On rotting conifer wood along the Broke-Off Mountain Trail, and on rotting Tsuga mertensiana wood at Crumbaugh Lake. This genus may better be placed in the Auriscalpiaceae of the Aphylllophorales.

Collections: 38734, 42762, 42852, 45336.

Dates: 8-12-67, 7-26-70, 7-29-70, 7-10-72.

Abundance: IV, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Western North America, LVNP.

Lentinus ponderosus O. K. Miller

On rotting conifer wood sometimes buried in the ground, including Pinus contorta var. murrayana, in the Drakesbad-Devil's Kitchen Trail. A large specimen was collected by ranger naturalists in the Chaos Jumbles area near Menzenitz Lake.

Collections: 41550, 45573.

Dates: 8-19-69, 7-11-72.

Abundance: IV, A.

Associates: Abies concolor, Pinus contorta var. murrayana.

Distribution: North America, LVNP.

Lyophyllum montanum A. H. Smith

Occasionally this medium sized grey mushroom is found on fir and hemlock litter and duff at the edge of snowbanks or on moist areas irrigated by melting snow in the higher mountain forests of the Park.

Collections: 33503, 38714, 39323, 49436, identified in part by H. E. Bigelow.

Dates: 8-14-62, 8-11-67, 7-10-68, 8-29-74.

Abundance: IV, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: California, LVNP.

Maresmius sp.

Found on old litter at Mineral, Tehama Co.,

Collection: J. Richardson

Date: Oct. 1969.

Mycena fibula (Fries) Kuehner

This is a small yellow mushroom (at first mistaken for a species of Gerronema) which fruits among mosses in meadow-like areas or in seepage areas and near springs. Specimens have been collected in a small meadow in a fir grove near the Chaos Jumbles, along springs above Paradise Meadows, in wet mossy areas under elder thickets along the Broke-Off Mountain Trail, along the Bumpass Mountain Trail, and along Juniper Lake.

Collections: 37179, 41272, 49308, 49437.

Dates: 7-12-66, 8-18-69, 8-26-74, 8-29-74.

Abundance: III, D.

Associates: mosses and herbs of stream banks, meadows and springs.

Distribution: Western Hemisphere, LVNP.

Mycena griseoviride A. H. Smith

This is a medium sized mushroom with a bell shaped cap and white spores. The cap is greyish yellow to light brown, and the stipe is yellow above becoming purplish near the base which is white woolly and sometimes occurs deep in a pile of rotten wood. It grows on piles of rotten fir and hemlock near melting snowbanks. As the moisture from the snow ^{evaporates} ~~disappears~~ the mushroom dries up.

Collections: 29549, 34142, 34988, 35023, 37149, 38732, 39362, 42901,
45522, 45597, 49344.

Dates: 7-2-54, 7-6-63, 7-3-65, 7-4-65, 7-11-66, 8-12-67, 8-11-68, 7-30-70,
7-10-72, 7-12-72, 8-27-74.

Abundance: II, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Washington, Oregon, Mt. Shasta, LVNP.

Mycena intertexta (Berkeley & Curtis) Saccardo

Collected on rotting conifer wood along the Broke-Off Mountain Trail.

Collection: 33512.

Date: 7-4-63.

Abundance: V, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: New York, North Carolina, South Carolina, California, LVNP.

Mycena lilacifolia (Peck) A. H. Smith

On very rotten logs under the bark or in spaces inside the log, this beautiful, delicate, small, lilac-colored mushroom fruits in fairly large numbers. It is so small, however, that it would take several hundred to make a good mouthful after they were cooked up, if they are found to be edible. Bumpass Hell area, Sunflower Flats area, Hat Creek area, Broke-Off Mountain Trail, Shadow Lake area, Mt. Harkness Trail.

Collections: 29552, 34090, 34204, 34939, 35024, 37155, 42779, 42913.

Dates: 7-2-54, 7-4-63, 7-7-63, 7-2-65, 7-4-65, 7-11-67, 7-27-70, 7-30-70.

Abundance: III, A.

Associates: Abies concolor, Abies magnifica, Pinus jeffreyi, Tsuga mertensiana.

Distribution: North America, LVNP.

Mycena overholtsii A. H. Smith & Solheim

This rather large mushroom, one of the larger *Mycenas*, has been found on rotting logs and stumps of Abies magnifica and Tsuga mertensiana. It remains fresh only as long as there is snow to furnish melting water to serve as an irrigant and humidity to prevent desiccation. The stipes are usually whitish and sometimes contorted. The caps are whitish grey and measure several inches across. It is found in subalpine areas in many western mountain regions.

Collections: 29553, 34989, 35020, 37173, 37185, 38713, 39363, 42876,
45514, 45575, 45594, 49410, 49413.

Dates: 7-2-54, 7-3-65, 7-4-65, 7-12-66, 7-14-66, 8-11-67, 7-11-68, 7-30-70,
7-9-72, 7-11-72, 7-12-72, 8-29-74.

Abundance: III, A.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Wyoming, California, LVNP.

Tricholoma sp.

A specimen was found near Mineral, Tehama Co.

Collection: L. Bodine.

Date: 9-29-69.

Tricholoma rhizoideum A. H. Smith

This is a large grey mushroom which is almost always found around melting snow in the western mountains. It has been found once in the Park. Several other kinds of mushroom appear much like it in size, shape, and color, but these may belong to such diverse genera as Lycophyllum, Entoloma, Melanoleuca, and possibly others. Careful collecting over a period of several weeks as the snow melts away in more than one spring season is required before this group can be characterized satisfactorily.

Collection: 26611

Date: 7-1-50

Abundance: V, D.

Associates: Abies magnifica.

Distribution: MacKenzie Pass, Oregon, Mt. Shasta, LVNP.

Tricholoma terreum (Schaeffer ex Fries) Kummer

On the ground near snow or under duff and litter which is still moist, this small grey mushroom fruits in fairly large numbers. The cap has darker fibrils radiating from the center. Possibly several species may be involved in the group of collections which have accumulated over several years, and to some of which this name has been given.

Collections: 26612, 29540, 29541, 34083, 35026, 35034, 35035, 35036,
37177, 37193, 45545, 45605.

Dates: 7-1-50, 7-2-54, 7-4-63, 7-4-65, 7-12-66, 7-14-66, 7-10-72, 7-12-72.

Abundance: III, D.

Associates: Abies concolor, A. magnifica, Pinus jeffreyi, Tsuga mertensiana.

Distribution: Widespread, LVNP.

AmanitaceaeAmanita sp.

Specimens of a species, possibly A. subalpinus, have been collected frequently in montane and subalpine areas. These fruit bodies develop under the duff which they push up forming small mounds. These rarely crack open showing a bit of the cap, and the fruit bodies rarely form on the surface of litter and duff layers. The caps and stipes are pale yellow with whitish scales on the cap surfaces. A veil is usually found on the stipe which has an enlarged base with a weak to well developed volva. While this is a large fleshy fungus, its appearance is reminiscent of the fly amanita which is poisonous, thus it is not presently considered a safe species to test for edibility.

Collections: Numerous.

Dates: Most years.

Amanita vaginata (Bulliard ex Fries) Vittadini

Specimens have been collected on the ground under conifers at Mineral, Tehama Co., and in the Sunflower Flats area. While this species is considered to be edible, it is too easily confused with poisonous species of Amanita to be considered safe.

Collections: 49314; J. Richardson.

Dates: 8-26-74, Oct. 1969.

Abundance: IV, D.

Associates: Abies concolor, Pinus jeffreyi, P. ponderosa.

Distribution: Europe, North America, LVNP.

VolvariaceaePluteus cervinus (Schaeffer ex Fries) Kummer

Specimens have been found in the Sunflower Flats area which could be assigned by sight to this species which has been used as a repository for any large grey to fawn-colored or brown mushroom with pink gills growing on rotting wood. Unfortunately the specimens were too old to survive drying and transport. This species, the deer mushroom, usually occurs on dead wood, has pink spores, and is edible.

Collection: 34945.

Date: 7-2-65.

Abundance: IV, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Widespread, LVNP.

EntolomataceaeEntoloma sp.

Specimens of several species assignable to this genus have been collected in the Park on conifer duff and litter, and at Mineral. Until the genus has been monographed critically, it will not be practical to complete identification of these.

Collections: J. Richardson, and others.

Dates: Oct. 1969, and other years.

CortinariaceaeCortinarius spp.

Specimens assignable to a number of species in this genus have been collected frequently in the Park, and at Mineral. In addition to occurring on the surface of duff and litter, some of these fruit under the duff, pushing it up and forming mounds which may or may not break open exposing the tops of the caps. Critical evaluation of most of these species must await completion of a monograph of this genus. Spore prints, knowledge of the colors of fresh materials of young and mature pilei and stipes, and of the flavor of the flesh are among important field data required for the study of these fungi.

Crepidotus sp.

Material of this small agaric was collected once on Abies magnifica bark. Unfortunately, it was inadequate for study. Species of this genus are usually small, without a stipe, and the cap is seated directly on the substratum.

Collection: 35056.

Date: 7-5-65.

Galerina autumnalis (Peck) A.P. Smith & Singer

Large clusters of this small brown mushroom are found inside rotting Abies concolor and other conifer rotting logs in the spring. This is reported to be a poisonous mushroom. Some collections of a very similar fungus may be assignable to Pholiota bridgii A. H. Smith & Hesler.

Collections: 34097, 34209, 34951, 34952, 34986, 37095, 37114.

Dates: 7-4-63, 7-7-63, 7-2-65, 7-3-65, 7-9-66, 7-10-66.

Abundance: III, A.

Associates: Abies concolor, A. magnifica, Pinus jeffreyi.

Distribution: North America, LVNP.

Hebeloma sp.

Collected once on the ground at Mineral, Tehama Co.

Collection: J. Richardson.

Date: Oct. 1969.

Inocybe spp.

Several species of this genus of relatively small mushrooms have been found in the Park. Their identification awaits critical study.

Collections: Numerous.

Dates: Most years.

Naematoloma spp.

Material assignable to this genus, but not identified to species, has been found at Mineral, Tehama Co., and in the Hat Lake area.

Collections: 42938; J. Richardson.

Dates: 9-29-69, 7-30-70.

Naematoloma sublateritium (Fries) Karsten

One collection of this species has been made at Mineral, Tehama Co.

Collection: L. Bodine.

Date: 9-29-69.

Abundance: IV, D.

Associates: Abies concolor, Pinus ponderosa.

Distribution: Widespread. LVNP.

Pholiota sp.

Several species of this genus have been found in the Park, and at Mineral, Tehama Co.

Collections: Several; J. Richardson.

Dates: Several years; Oct. 1969.

Pholiota squarrosa-adiposa Lange

Specimens assigned to this species, one of the heart-wood growing agarics, were found in late September, indicating a possible cause of the death of the tree on whose wood it was found. On Abies concolor below Summit Lake.

Collection: 26980.

Date: 9-26-50.

Abundance: V, A.

Associates: Abies concolor, Pinus contorta var. murrayana.

Distribution: Widespread, LVNP.

Pholiota bridgii A. H. Smith & Hesler

Collected in large clusters on several logs of Abies magnifica along the trail below Paradise Meadows. Edibility of this brown mushroom is uncertain since the similar species, Galerina autumnalis, is poisonous.

Collections: 49400, 49401, 49402.

Date: 8-29-74.

Abundance: IV, A.

Associates: Abies magnifica, Pinus contorta var. murrayana.

Distribution: Mt. Shasta, LVNP.

Ramicola sp.

Specimens assigned to this genus were collected at Mineral, Tehama Co.

Collection: 34947.

Date: 7-7-65.

Coprinaceae

Coprinus comatus Fries

Found once at Mineral, Tehama Co.

Collection: J. Richardson.

Date: Oct. 1969.

Abundance: III, D.

Associates: Abies concolor, Pinus ponderosa.

Distribution: Europe, North America, LVNP.

Panaeolus semiovatus (Fr.) Lundell

Anellaria separata (Linnaeus ex Fries) Karsten

This species, which normally fruits on horse manure, has been reported from the Park. It was probably found near a corral or along a trail.

Collection: E. E. Morse (University of California, Berkeley).

Date: Sept. 1928.

Abundance: V, G.

Associates: Unknown.

Distribution: Europe, North America, LVNP.

StrophariaceaeStropharia sp.

Found on soil along the Broke-Off Mountain Trail, and at Les Bodine's Place, Mineral, Tehama Co.

Collections: 33514, 42798.

Dates: 8-14-62, 7-27-70.

RussulaceaeLactarius deliciosus (Fries) S. F. Gray

Specimens assigned to this species were collected at Mineral, Tehama Co. It is an orange mushroom with colored milk whose flesh turns green when bruised or broken. As the name implies, it is reported to be delicious.

Collection: J. Richardson.

Date: Oct. 1969.

Abundance: IV, D.

Associates: Abies concolor, Pinus ponderosa.

Distribution: Europe, North America, LVNP.

Russula sp.

Specimens of one species have been found at Mineral, Tehama Co.

Collection: Les Bodine

Date: 9-29-69.

Russula brevipes PeckRussula delica Fries

Specimens of this large coarse white mushroom have been found in conifer woods: Broke-Off Mountain Trail, woods above Matteson's cottage, Mineral, Tehama Co.

Collections: 35019, 49282.

Dates: 7-4-65, 8-25-74.

Abundance: IV, D.

Associates: Abies concolor, A. magnifica, Calocedrus decurrens, Pinus ponderosa, Tsuga mertensiana.

Distribution: Europe, North America, LVNP.

Paxillaceae

Paxillus panuoides (Fries ex Fries) Fries

Found once on the under side of a conifer log in the King Creek picnic area. This mushroom is sessile and is usually attached by the top of the pileus to the under side of rotting logs.

Collection: 42843.

Date: 7-28-70.

Abundance: V, A.

Associates: Abies magnifica.

Distribution: Europe, Africa, North America, LVNP.

Boletaceae

Boletus spp.

Several as yet unidentified species of Boletus, in the larger sense, have been collected in the Park and at Mineral. Their identification awaits critical study. The members of this family include genera such as Boletus, Suillus, Tylopilus and others in which spores are borne in tubes rather than on gills.

Boletus edulis Fries

Found on soil under duff under conifers along the trail to Boiling Springs lake in the Warner Valley. Its specific name indicates it is edible.

Its common German name, Steinpilz, indicates it is a fungus which looks like a stone.

Collection: 37083.

Date: 7-9-66.

Abundance: V, D.

Associates: Abies concolor, Calocedrus decurrens, Pinus contorta var. murrayana.

Distribution: Europe, North America, LVNP.

Boletus abieticola Thiers

This is a large bolete with a pinkish brown cap and yellow flesh which turns blue when cut or bruised, although sometimes slowly, growing in montane conifer forests usually under Abies magnifica. Found along the Terrace Lake Trail. According to Les Bodine, who ate part of a large specimen with two friends, it is a tasty, edible species.

Collection: 49399.

Date: 8-29-74.

Abundance: IV, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Mt. Shasta, LVNP.

Suillus vulcanalis Thiers

This large yellow mushroom was found abundantly under Pinus jeffreyi near Cinder Cone in early July, 1965. It was also found at the Manzanita Lake Visitor Center under Jeffrey pines.

Collections: 35054, 35066.

Dates: 7-5-65, 7-6-65.

Abundance: III, D.

Associates: Abies concolor, Pinus jeffreyi, Pinus ponderosa.

Distribution: Lassen Volcanic National Park.

Tylophilus felleus (Bulliard ex Fries) Karsten

This large mushroom with tubes instead of gills on the under side of the cap has been collected once in the Park: "Terrestrial at Mt. Lassen."

Collection: W. R. Hanna, identified by W. C. Strauser, University of California, Berkeley, Herbarium, No. 528301.

Date: 5-6-34.

Abundance: V, D.

Associates: Conifers.

Distribution: Europe, North America, LVNP.

Gasteromycetes

Hymenogastreales

Rhizopogonaceae

Rhizopogon argillaceus A. H. Smith

Hypogaeous under conifers, Warner Creek Campground area.

Collection: 37116, identified by J. M. Treppe.

Date: 7-10-66

Abundance: V, D.

Associates: Abies concolor, Pinus ponderosa, Pinus contorta var. murrayana.

Distribution: Idaho, Oregon, California, LVNP.

Rhizopogon atroviolaceus A. H. Smith

Hypogaeous under Tsuga mertensiana near the Terrace Lake Trail.

Collection: 49440.

Date: 8-29-74.

Abundance: V, D.

Associate: Tsuga mertensiana.

Distribution: Idaho, LVNP.

Rhizopogon (nr.) subcaerulescens A. H. Smith

Hypogaeous under conifers along the road to Juniper Lake, Plumas Co.

Collection: 41277.

Date: 8-18-69.

Abundance: V, D.

Associates: Abies concolor, Pinus ponderosa.

Distribution: Idaho, Oregon, California, LVNP.

Rhizopogon subcaerulescens var. subpannosus A. H. Smith

Hypogaeous under Tsuga mertensiana near the head of the Terrace Lake Trail.

Collections: 49441, 49442, identified by J. M. Trappe.

Date: 8-29-74.

Abundance: IV, D.

Associate: Tsuga mertensiana.

Distribution: Idaho, Washington, LVNP.

Rhizopogon vulgaris (Vittadini) M. Lange vel aff.

Hypogaeous in soil under conifers including Abies concolor in the Nobles' Immigrant Pass area, . . in woods on Battle Creek Meadows Ranch, and under Tsuga mertensiana along the upper Terrace Lake Trail.

Collections: 49312, 49388, 49439, identified by J. M. Trappe.

Dates: 8-26-74, 8-28-74, 8-29-74.

Abundance: IV, D.

Associates: Abies concolor, Calocedrus decurrens, Pinus lambertiana,

P. ponderosa, Tsuga mertensiana.

Distribution: Europe, Nova Scotia, Tennessee, Idaho, LVNP.

SecotiaceaeEndoptychum agaricioides Czernisev

This mushroom-like fungus whose cap never opens but encloses a purple-black mass of spores has been found under duff under Abies concolor in the Sunflower Flats area, and around Manzanita Lake.

Collections: 38689, 39377.

Dates: 8-10-67, 7-12-68.

Abundance: IV, B.

Associates: Pinus jeffreyi, Abies concolor.

Distribution: Europe, North America, LVNP.

Endoptychum depressum Singer & A. H. Smith

Found once under litter and duff under conifers in a mixed conifer forest on the Battle Creek Meadows Ranch, Mineral, Tehama Co.

Collection: 49360, identified by J. M. Trappe.

Date: 8-28-74.

Abundance: V, D.

Associates: Abies concolor, Calocedrus decurrens, Pinus lambertiana,
P. ponderosa.

Distribution: Western United States, LVNP.

Gastroboletus turbinatus (Snell) A. H. Smith & Singer

In this fleshy fungus which fruits under duff in conifer woods, the spores are borne in tube-like glebal chambers similar to the tubes produced by species of Boletus, but the tubes are distorted, and the spores are not discharged violently. Found in the Warner Creek Campground area, and along the Broke-Off

Mountain Trail.

Collections: 37117, 38731.

Dates: 7-10-66, 8-12-67.

Abundance: IV, D.

Associates: Abies concolor, A. magnifica, Pinus ponderosa, P. jeffreyi.

Distribution: Missouri, Pacific Northwest, California, LVNP.

Nivetogastrium nubigenum (Harkness) Singer & A. H. Smith

This fungus fruits on old wood and sticks near melting snow throughout the higher elevations in the Park. Its fruit bodies look like those of unopened mushrooms. It is not found after the snow has melted and the litter and duff has dried up, probably since squirrels like ^{the caps} ~~them~~ as food, set them out to dry, and sometimes store them. While it is sometimes classified with the puffball-like fungi, its relationships are considered by some to be more with the [^] mushroom-like fungi. It has lost the ability to violently discharge its spores so these are piled up in gleba-like compartments formed by the irregularly contorted gill-like tissues on which they are produced.

Collections: 26615, 26634, 26635, 26646, 29558, 30392, 34049, 34956,
34958, 35056, 38711, 38727, 39319, 39348, 42776, 42840,
42919, 45535, 45569, 45591, 49321, 49426.

Dates: 7-1-50, 7-2-54, 7-22-56, 7-4-63, 7-3-65, 7-5-65, 8-11-67, 8-12-67,
7-10-68, 7-11-68, 7-27-70, 7-28-30, 7-30-70, 7-10-72, 7-11-72,
7-12-72, 8-27-74, 8-29-74.

Abundance: III, A.

Associates: Abies magnifica, Pinus monticola, Tsuga mertensiana.

Distribution: Western United States, LVNP.

Thaxterogaster sp.

Collected once along the Terrace Lake Trail.

Collection: 42921, identified by J. M. Trappe.

Thaxterogaster pingue (Zeller) Singer & A. H. Smith

While this fungus has a similar appearance and habitat to those of Nivatogastrium nubigenum, it is frequently found late in the season in a hypogaeous habitat under litter and duff; King Creek Meadows area, Broke-Off Mountain Trail, and along the lower part of the Summit Trail.

Collections: 35050, 34139, 34956A, 34997.

Dates: 7-4-63, 7-6-63, 7-3-65, 7-4-65.

Abundance: IV, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Western United States, Mt. Shasta, LVNP.

HydnangiaceaeHydnangium "rubescens"

Material assigned to this species was found once under duff near the base of a tree of Abies magnifica near Cold Boiling Lake.

Collection: 30014

Date: 7-30-55.

Abundance: V, D.

Associate: Abies magnifica.

GautierialesGautieriaceaeGautieria monticola Harkness

Clusters of large truffle-like fruit bodies have been found under duff under Abies concolor and Tsuga mertensiana trees in the Sunflower Flats area,

King Creek Meadows, and the Nobles' Immigrant Pass area. Finding the species of this genus, and of other genera of hypogaeous fungi, is like finding a hill of small potatoes under the ground. Also found at Mineral, Tehama Co. Mr. O. K. Halladay of the Mineral Ranger Station, Lassen National Forest, has reported that he collects "truffles", hypogaeous fungi, commonly and eats all kinds he finds, not realizing that more than one kind was present.

Collections: 30038, 38682, 45537, J. Richardson.

Dates: 7-31-55, 8-10-67, Oct. 1969, 7-10-72.

Abundance: IV, D.

Associates: Abies concolor, A. magnifica, Pinus ponderosa, Tsuga mertensiana.

Distribution: Europe, Western North America, LVNP.

Gautiera sp.

Specimens assigned to this as yet undescribed species have been found on the Broke-Off Mountain Trail.

Collection: 42867.

Date: 7-29-70.

Abundance: V, D.

Associates:

Lycoperdales

Lycoperdaceae

Bovista californica Kreisel

Collected on soil on the shore of Hat Lake.

Collection: Lee Bonar, No. 467 of California Fungi distributed by the Herbarium, University of California, Berkeley. Identified by H. Kreisel and published as a new species in Nova Hedwigia, Beiheft 25: 90. 1967.

Date: July, 1934.

Abundance: V, D.

Associates: Salix spp.

Distribution: Lassen Volcanic National Park.

Bovista plumbea Persoon

Several puffballs, medium sized and lead grey in color, were found on a rocky creek bottom near the Visitor's Center at Manzanita Lake.

Collections: 34103, 45578.

Dates: 7-5-63, 7-11-72.

Abundance: IV, D.

Associates: Abies concolor, Pinus ponderosa.

Distribution: Widespread, LVNP.

Bovistella radicata (Durieu & Montagne) Patouillard

Found once in the Park around Manzanita Lake.

Collection: 39376.

Date: 7-12-68.

Abundance: V, D.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: North America, LVNP.

Calbovista subsculpta Morse

Found once on trails around Boiling Springs Lake, Warner Valley.

Collection: 37100.

Date: 7-9-66.

Abundance: IV, D.

Associates: Abies concolor, Calocedrus decurrens.

Distribution: California, LVNP.

Calvatia bovista Pers. var. hungarica (Hollos) Smarda

Found on the ground in open mixed conifer forest at Battle Creek Meadows Ranch near Mineral, Tehama Co., and in an open meadow at Drakesbad.

Collections: 45578, 49358, 49359, in part identified by V. Demoulin, tentatively.

Dates: 7-11-72, 8-28-74.

Abundance: IV, D.

Associates: Abies concolor, mixed conifers, meadow herbs and grasses.

Distribution: Europe, Western United States, LVNP.

Calvatia fragilis (Vittadini) Morgan

These small, delicate puffballs have been found in the Park in the aspen grove above Hat Lake.

Collection: 37127.

Date: 7-11-66.

Abundance: V, D.

Associates: Populus tremuloides.

Distribution: Europe, Texas, Michigan, LVNP.

Calvatia fumosa Zeller

This small thick-walled puffball is found occasionally in conifer woods throughout the Park. The surface is smooth and whitish. All puffballs which are white in section when young are considered edible, but to my knowledge nothing is known about the edibility of this species.

Collections: 30037, 30337, 33493, 34995, 37132, 37188, 38724, 39346,

42744, 42793, 42832, 42859, 42917, 45534, 45590, 49336, 49428.

Dates: 7-31-55, 8-14-62, 7-4-65, 7-11-66, 7-14-66, 8-12-67, 7-11-68, 7-25-70,

7-27-70, 7-28-70, 7-29-70, 7-30-70, 7-10-72, 7-12-72, 8-27-74, 8-29-74.

Abundance: III, D.

Associates: Most conifers in the Park.

Distribution: Wyoming, Pacific Coast States, LVNP.

Calvatia ?lycoperdoides A. H. Smith

Found on the ground under Abies magnifica and Tsuga mertensiana along the Broke-Off Mountain Trail.

Collection: 45587, tentatively identified by V. Demoulin.

Date: 7-12-72.

Abundance: V, D.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Idaho, Washington, California, LVNP.

Calvatia sculpta (Herkness) Lloyd

A large puffball with large pyramidal warts on the outer surface. The mature gleba is olive green. Several large specimens have been found on gravel fill behind the service garage at the Manzanita Lake Ranger Station, and along the Broke-Off Mountain Trail. Considered edible as long as the flesh is white.

Collections: 38744, 42861.

Dates: 8-12-67, 7-29-70.

Abundance: IV, D.

Associates: Salix spp., Abies magnifica, Pinus jeffreyi, Tsuga mertensiana.

Distribution: Pacific Coast States, LVNP.

Calvatia subcretacea Zeller

The outer surface of this small puffball is divided into small wart-like scales which are dark tinted at their tops, the remainder of the surface being white. It is found on the ground in conifer woods. Nothing is known of its edibility.

Collections: 33492, 34128, 34974, 34996, 35049, 37072, 37134, 37168,
38725, 39347, 42860, 45483, 45486, 45533, 45566, 45589, 49337.

Dates: 8-14-62, 7-5-63, 7-3-63, 7-4-65, 7-5-65, 7-9-66, 7-11-66, 7-12-66,
8-12-67, 7-11-68, 7-29-70, 7-9-72, 7-10-72, 7-11-72, 7-12-72, 8-27-74.

Abundance: III, D.

Associates: All conifers occurring above 6500 feet.

Distribution: Oregon, California, LVNP.

Peck

Lycoperdon (nr.) coloratum [^]sensu Coker & Couch

Young puffballs assigned to this species were found in the vicinity
of Manzanita Lake.

Collection: 38749.

Date: 8-13-67.

Abundance: V, D.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: North America, LVNP.

Vascellum curtisii (Berkeley) Kreisel

Specimens of this species have been collected on soil in lawns at the
Manzanita Lake Visitor Center, and at Mineral, Tehama Co.

Collections: 35047, J. Richardson.

Dates: 7-5-65, Oct. 1969.

Abundance: IV, D.

Associates: Lawn grasses.

Distribution: Europe, North America, LVNP.

Lycoperdon pusillum Persoon

Specimens of this species have been found in the vicinity of Hat Lake.

Collection: 37133

Date: 7-11-66.

Abundance: V, D.

Associates: Salix spp.

Distribution: Europe, North America, LVNP.

Sclerodermatales

Astraeaceae

Astraeus pteridis (Shear) Zeller

The exoperidium of this large earth star puffball was found in the Reflection Lake area. When young and fresh this would have looked like a medium-sized, thick-walled puffball. It is surrounded by a subfleshy peridium which, at maturity, becomes split into a number of rays which would open in moist weather and close in dry weather "puffing" the spores into the air.

Collection: 35067.

Date: 7-6-65.

Abundance: V, D.

Associates: Abies concolor, Pinus ponderosa.

Distribution: Pacific Coast States, LVNP.

Pisolithaceae

Pisolithus tinctorius (Persoon) Coker & Couch

The fruit bodies of this medium large fungus were found in the trails around Boiling Springs Lake and the Devil's Kitchen. They are like a puffball with a short thick stalk on top of which is a mass of spores arranged in small hard clusters which are like "stone-peas" from which the fungus gets its name. These hard spore masses or peridioles break down into olive green masses of spores.

Collections: 37074, 37109.

Date: 7-9-66.

Abundance: IV, D.

Associates: Abies concolor, Calocedrus decurrens, Pinus contorta var.
murrayana, Quercus vaccinifolia.

Distribution: Widespread, LVNP.

Sclerodermataceae

Scleroderma areolatum Ehrenberg

Scleroderma lycoperdoides Schrader

A small hard shelled puffball found in the Park between Lower Twin Lake and Butte Lake.

Collection: 35048.

Date: 7-5-65.

Abundance: V, D.

Associates: Pinus ponderosa.

Distribution: North America, LVNP.

Scleroderma hypogaeum Zeller

Found on the ground in a pine plantation planted in the old Manzanita Lake Campground, Manzanita Lake area.

Collection: 38745.

Date: 8-13-67.

Abundance: V, D.

Associate: Pinus jeffreyi.

Distribution: Oregon, California, LVNP.

Sedeculaceae

Sedecula pulvinata Zeller

Collected under conifers on Battle Creek Meadows Ranch, Mineral, Tehama Co.

Collection: 49390.

Date: 8-28-74.

Abundance: V, D.

Associates: Abies concolor, Calocedrus decurrens, Pinus ponderosa.

Distribution: Mount Shasta, LVNP.

Nidulariales

Nidulariaceae

Crucibulum levis (DeCandolle) Kambly & Lee

Found on decaying sticks in a corral area on Battle Creek Meadows Ranch, Mineral, Tehama Co.

Collection: 49362.

Date: 8-28-74.

Abundance: V, A.

Associates: Abies concolor, Pinus ~~ponderosa~~ ponderosa.

Distribution: Cosmopolitan, Tehama Co.

Deuteromycotina

Coelomycetes

Sphaeropsidales

Sphaeropsidaceae

Coniothyrium arctostaphyl. 1 (Vize) Tassi

Found on leaves of the green manzanita, Arctostaphylos patula, in the Manzanita Lake area. Along the Broke-Off Mountain Trail leaves of entire branches of the mountain manzanita (Arctostaphylos nevadensis) may be killed.

Collections: 30909, 30910; Lee Boner, California Fungi 1133.

Dates: 7-10-62, 8-18-57.

Abundance: IV, B.

Associates: Ceanothus velutinus; Pinus albicaulis, Tsuga mertensiana.

Distribution: California, LVNP.

Diplodia veratri Earle

Found on dead stems of the mountain hellebore, Veratrum californicum, with other fungi causing their decay, King Creek Meadows, Broke-Off Mountain Trail.

Collections: 26660, 35012.

Dates: 7-1-50, 7-4-65.

Abundance: IV, C.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Western North America, LVNP.

Hendersonia sp.

Found on dead stems of Lupinus obtusilobus along the Summit Trail.

Collection: 29529.

Date: 7-1-54.

Phoma spp.

Isolated from shore sediment with iron oxide at Emerald Lake; and from soils near a litter can at the Manzanita Lake Visitor Center, from soil around a bench near the Manzanita Lake Ranger Station, and from a campside near the stove area in a chaparral area in the Manzanita Lake Campground.

Dates: 8-18-57, 7-8-63.

Phyllosticta ferax Ellis & Everhart

Found on leaves of Lupinus sp. and of L. sellulus on the Manzanita Creek Trail and in Crumbaugh Meadows.

Collections: 42767; H. Stanley.

Dates: 7-26-70, 8-28-72.

Abundance: IV, C.

Associates: Abies concolor, A. magnifica, Pinus ponderosa.

Distribution: On more than 4 species of Lupinus in western North America, LVNP.

Phyllosticta melanoploca de Thuemen

Large black spots on living leaves of Veratrum californicum are caused by this fungus which produces small flask-shaped pycnidia in the blackened spots; Broke-Off Mountain Trail, Crumbaugh Meadows.

Collections: 33473; L. Bonar (Univ. of California Herbarium); H. Stanley.

Dates: 1934, 8-14-62, 8-28-72,

Abundance: III, C.

Associates: Herbs and grasses of stream sides and meadows.

Distribution: Siberia, Europe, California, Mt. Shasta, LVNP.

Phyllosticta monardellae W. B. Cooke

Found on leaves of Monardella odoratissima, the pennyroyal, near Crumbaugh Lake.

Collection: H. Stanley.

Date: 8-28-72.

Abundance: V, C.

Associates: Herbs of dry meadows.

Distribution: Mt. Shasta, LVNP.

Pyrenochaeta terrestris (Hansen) Gorenz, J.C.Walker & Larson.

Isolated from a soil sample from near a bench near the Manzanita Lake Ranger Station.

Date: 7-8-63.

Abundance: V, D.

Associates: Pinus jeffreyi

Distribution: Widespread, LVNP.

Phymatospora berkeleyi Saccardo

This is another of the fungi which helps remove dead stems of various types of flowering plants during the year after the plant has blossomed.

Found on Lupinus obtusilobus near the upper limits of plant growth on the Summit Trail.

Collection: 29529.

Date: 7-1-54

Abundance: V, C.

Associates: Pinus albicaulis.

Distribution: Western United States, LVNP.

Septoria lunelliana Saccardo

Found on senescent leaves of Carex fraxa, Manzanita Creek Trail.

Collection: 42766.

Date: 7-26-70.

Abundance: V, C.

Associates: Streamside and meadow herbs and grasses.

Distribution: North Dakota, Mt. Shasta, LVNP.

Several species of Phoma, a species of Chaetomella, and Pyrenochaeta terrestris have been isolated from soil samples. Since species assigned to these genera have been usually identified on the basis of the flowering plant on which they are usually found and on which they produce leaf and stem diseases, it is not easy, or even practical, at present, to assign the isolated strains to a species.

MelanconialesMelanconiaceaeCryptostictis arbuti (Bonar) Zeller

Small dark spots on the leaves of the green manzanita, Arctostaphylos patula, are produced by this fungus. Found in chaparral near Manzanita Lake.

Collection: 26667.

Date: 7-1-50.

Abundance: V, B.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: Oregon, California, Mt. Shasta, LVNP.

Cylindrosporium verstrinum Saccardo & Winter.

This is a second fungus which produces blackened spots on leaves of Verstrum californicum. Found along the trail to Boiling Springs Lake, the Mt. Harkness Trail, and the Broke-Off Mountain Trail.

Collections: 37086, 42775, 42875.

Dates: 7-9-66, 7-27-70, 7-29-70.

Abundance: III, C.

Associates: Herbs and grasses of wet meadows.

Distribution: Switzerland, Mt. Shasta, LVNP.

Melanconium sp.

An unidentified species assigned to this genus was found on needles of Abies concolor on the east shore of Manzanita Lake in association with Mollisia piceae.

Collection: Lee Bonar, Identified by J. W. Groves.

Date: 7-10-62.

BlastomycetesCryptococcalesCryptococcaceaeCandida sp.

Isolated from water from Emerald Lake.

Date: 8-18-57.

Candida pseudotropicalis (Castellani) Basgal

Isolated from soil around a litter can at the Manzanita Lake Visitor Center.

Date: 7-8-63.

Abundance: V, D.

Associates: Pinus jeffreyi.

Distribution: Europe, North America, LVNP.

Cryptococcus albidus (Saito) Skinner var. albidus

Isolated from slime flux on Wisteria sp. by Phaff, et al. (1972).

Date: Summer, 1970.

Abundance: V, B.

Associates: Wisteria sp.

Distribution: Cosmopolitan.

Cryptococcus albidus var. diffluens (Zack) Phaff & Fell

Isolated from soil near a litter can at the Manzanita Lake Visitor Center.

Date: 7-8-63.

Abundance: V, D.

Associates: Pinus jeffreyi.

Distribution: Europe, North America, LVNP.

Cryptococcus infirmo-miniatus (Okunuki) Phaff & Fell

Isolated from slime flux on Wisteria sp. by Phaff, et al. (1972).

Date: Summer, 1970.

Abundance: V, B.

Associate: Wisteria sp.

Distribution: Japan, New Zealand, Mauritius, Antarctica, Europe, California.

Cryptococcus laurentii (Kufferath) Skinner var. laurentii

Isolated from slime flux on Wisteria sp. by Phaff, et al. (1972).

Date: Summer, 1970.

Abundance: IV, B.

Associates: Wisteria sp.

Distribution: Cosmopolitan.

Cryptococcus macerans (Fredericksen) Phaff & Fell

Isolated from slime flux on Wisteria sp. by Phaff, et al. (1972).

Date: Summer, 1970.

Abundance: IV, B.

Associate: Wisteria sp.

Distribution: Denmark, Netherlands, Saskatchewan, California.

Rhodotorula spp.

Isolated from waters from Lake Helen, and from Emerald Lake; from soil samples from the vicinity of a bench near the Manzanita Lake Ranger Station, from the lawn near that Ranger Station; and from the Manzanita Lake Campground from an undisturbed area under pine and chaparral, from areas near a stove and in a tent area in a campsite in chaparral, and from areas near a table, the stove, and a tent area in a campsite under Pinus jeffreyi.

Dates: 8-18-57, 7-8-63.

Rhodotorula graminis di Menna

Isolated from slime flux on Wisteria sp. by Phaff, et al. (1972).

Date: Summer, 1970.

Abundance: V, B.

Associates: Wisteria sp.

Distribution: New Zealand, Japan, Indonesia, Saskatchewan, California.

Torulopsis norvegica Reiersoel

Isolated from slime flux on Wisteria sp., by Phaff, et al. (1972).

Date: Summer, 1970.

Abundance: V, B.

Associates: Wisteria sp.

Distribution: Norway, Sweden, Switzerland, South Africa, England, California.

Trichosporon pullulans (Lindner) Diddens & Lodder

Isolated from slime flux on Wisteria sp. by Phaff, et al. (1972).

Date: Summer, 1970.

Abundance: V, B.

Associates: Wisteria sp.

Distribution: Northern Europe, Czechoslovakia, Australia, Antarctica, California.

HyphomycetesMonilialesMoniliaceaeAlternaria alternata (Fries) Keissler

Isolated from soil samples from near a litter can at the Manzanita Lake Visitor Center, a bench near the Manzanita Lake Ranger Station; from an undisturbed area under *Pinus jeffreyi* and chaparral; and from soils from a table area, stove

area, and tent area in a camp site in chaparral, and from a tent area in a campsite under Pinus jeffreyi, in the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: III, D.

Associates: Pinus jeffreyi; Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Arthrinium cuspidatum (M. C. Cooke & Harkness) von Hoehnel

Found on dead culms of Juncus balticus var. montanus near Manzanita Lake, and in a small meadow near the Chaos Jumbles.

Collections: 38680, 39388, 42743.

Dates: 8-10-67, 7-12-68, 7-25-70.

Abundance: IV, C.

Associates: Juncus balticus var. montanus.

Distribution: Denmark, England, Western North America, LVNP.

Aspergillus flavus Link ex Link

Isolated from soil samples from the Manzanita Lake Campground, from a tent area in a campsite in chaparral, and a table area under Pinus jeffreyi.

Date: 7-8-63.

Abundance: IV, D.

Associates: Pinus jeffreyi; Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Aspergillus fumigatus Fresenius

Isolated from soil samples from summit fumaroles.

Date: 7-21-56.

Abundance: V, D.

Associates: Aspergillus niger.

Distribution: Cosmopolitan, LVNP.

Aspergillus glaucus Group

On an incompletely dried conk of Inonotus dryadeus shioped from Mineral to Cincinnati.

Collection: 41547.

Date: 9-29-69.

Abundance: IV, F.

Associates: Other molds.

Distribution: Cosmopolitan.

Aspergillus nidulans (Eidam) Winter

Isolated from a soil sample from a stove area in a chaparral campside in the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: V, D.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Aspergillus niger van Tieghem

Many kinds of molds are present in decaying materials and the soil, but it is usually not possible to see them as they appear in nature. Instead, we take a sample of soil, or other material, to the laboratory, mix it with special nutrients in a semi-solid gelatinous material called agar, and observe the colonies which develop. Using this technique it was found that this species of mold, with several others including species of Penicillium and Mucor, was common in the soil found around fumaroles, especially the one used for a garbage incinerator, on the west rim of the summit crater complex. Also isolated from soil samples taken at the litter can at the Manzanita Lake Visitor Center; and in the Manzanita Lake Campground at a table area, a stove area, and a tent area

in a chaparral campsite; a table area, and a tent area at a campsite under Pinus jeffreyi; and in an undisturbed area under Pinus jeffreyi and chaparral.

Dates: 7-21-56, 7-8-63.

Abundance: II, D.

Associates: Organisms of fumaroles; Pinus jeffreyi; Arctostaphylos patula,
Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Aspergillus ochraceus Wilhelm

Isolated from a soil sample from the lawn at the Manzanita Lake Ranger Station; and from a tent area in a campsite in chaparral in the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: IV, D.

Associates: Arctostaphylos patula, Ceanothus velutinus, lawn grasses.

Distribution: Cosmopolitan, LVNP.

Aspergillus sydowii (Bainier & Sartory) Thom & Church

Isolated from a soil sample from near the litter can at the Manzanita Lake Visitor Center; from water, bottom sediments, sediments at the water's edge, and from moist soil near Lake Helen; and from shore sediment with iron oxide on Emerald Lake. Also found on imperfectly dried conk of Inonotus dryadeus shipped from Mineral to Cincinnati.

Collection: 41548.

Dates: 8-18-57, 7-8-63, 9-29-69.

Abundance: III, D.

Associates: Organisms in lake water and sediments, molds on conks, Pinus jeffreyi.

Distribution: Cosmopolitan, LVNP.

Pureobasidium pullulans (deBary) Arnaud

Isolated from a soil sample collected at a bench near the Manzanita Lake Ranger Station, from the lawn at the Ranger Station; from the Manzanita Lake Campground from an undisturbed area under Pinus jeffreyi and chaparral, from a table area and a ~~stove~~^{tent} area in a chaparral campsite, from a table area, a stove area, and a tent area in a campsite under Pinus jeffreyi; and from shore sediment with iron oxide at Emerald Lake.

Dates: 8-18-57, 7-8-63.

Abundance: II, D.

Associates: Organisms in lake shore sediments; Pinus jeffreyi, Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Bahusakala sp.

Found as a black mold on branches of Salix sp., Manzanita Lake District Ranger's office area.

Collection: 34107, identified by M. B. Ellis and a portion deposited in the herbarium of the Commonwealth Mycological Institute, Kew, England, as CMI-165357.

Date: 7-5-63.

Botryotrichum sp.

Isolated from soil samples collected near the litter can at the Manzanita Lake Visitor Center, a bench near the Ranger Station, undisturbed soil under Pinus jeffreyi and chaparral near the Manzanita Lake Campground, near a table and a stove in a chaparral campsite and near a stove in a campsite under Pinus jeffreyi.

Date: 7-8-63.

Botrytis cinerea Persoon ex Fries

One of the commoner molds on decaying stems of Veratrum californicum.

Collection: 26604.

Date: 7-1-50.

Abundance: IV, C.

Associates: Herbs and grasses of wet meadows.

Distribution: Cosmopolitan, LVNP.

Cephalosporium spp.

Isolated from soils collected in a tent area in a chaparral campsite, and from a stove area in a campsite under Pinus jeffreyi at Manzanita Lake Campground.

Date: 7-8-63.

Cladobotryum sp.

Collected on litter under Pinus jeffreyi and Abies concolor in the Sunflower Flats area.

Collection: 34058, identified by M. B. Ellis, CMI-165356.

Date: 7-4-63.

Cladobotryum variospermum (Link) Hughes

Didymocladium ternatum (Bonorden) Saccardo

Diplocladium majus Bonorden

Found on fruit bodies of various fungi including species of Polyporus and Mycena in the Sunflower Flats area and along the Mt. Harkness Trail.

Collections: 34076A, 34082, 42718, 42786, identified by C. T. Rogerson.

Dates: 7-4-63, 7-27-70.

Abundance: IV, F.

Associates: Abies concolor, A. magnifica, Pinus jeffreyi.

Distribution: Europe, North America, LVNP.

Cladosporium spp.

Isolated from soil samples collected at a bench at the Manzanita Lake Ranger Station, from the lawn at that Ranger Station, from undisturbed soil under Pinus jeffreyi and chaparral near the Manzanita Lake Campground, and from a table area and a tent area in a chaparral campsite.

Date: 7-8-63.

Cladosporium cladosporioides (Fresenius) deVries

Isolated from a sample of water from Lake Helen, and from soil samples in the Manzanita Lake area: from soil near a litter can at the Manzanita Lake Visitor Center, from near a bench near the Ranger Station, from the lawn at the Ranger Station, and from most samples taken in the Campground.

Dates: 8-18-57, 7-8-63.

Abundance: II, D.

Associates: Organisms in lake water, Pinus jeffreyi, Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Cladosporium herbarum Persoon ex Fries

Collected on discarded orange peel at 10,000 ft. on the Lassen Peak Summit Trail, and on dead leaves of Bromus sp. and Carex spectabilis at Crumbaugh Lake.

Collections: 29513, H. Stanley.

Dates: 7-1-54, 8-28-72.

Associates: Herbs and grasses of meadows.

Distribution: Cosmopolitan, LVNP.

Costantinella terrestris (Link ex Persoon) Hughes

Found on rotting wood of Abies concolor at Sunflower Flats area.

Collection: 34937.

Date: 7-2-65.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Widespread, LVNP.

Curvularia geniculata (Tracy & Earle) Boedijn

Isolated from soil samples collected near a litter can at the Manzanita Lake Visitor Center, and from the lawn at the Ranger Station.

Date: 7-8-63.

Abundance: IV, D.

Associates: Pinus jeffreyi, lawn grasses.

Distribution: North and Central America, LVNP.

Curvularia lunata (Walker) Boedijn

Isolated from soil samples collected in the Manzanita Lake Campground: in table, stove, and tent areas in a chaparral campsite, and in stove and tent areas in a campsite under Pinus jeffreyi.

Date: 7-8-63.

Abundance: III, D.

Associates: Pinus jeffreyi, Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Dendryphium atrum Corda

Found as a black mold on ⁹twigs of Salix sp., Summit Lake.

Collection: 26664.

Date: 7-1-50.

Abundance: V, B.

Associate: Salix spp.

Distribution: Europe, North America, LVNP.

Diplococcium spicatum Grove

Found on conifer wood in the Sunflower Flats area.

Collection: 34927A-b, identified by M. B. Ellis, CMI-165379.

Date: 7-2-65.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Great Britain, LVNP.

Epicoccum purpurascens Ehrenberg ex Schlechtendahl

Isolated from soil samples collected near a litter can at the Manzanita Lake Visitor Center, near a bench near the Ranger Station, and in a tent area in a campsite under Pinus jeffreyi in the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: III, D.

Associates: Pinus jeffreyi, Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Epochnium isthoporphum Saccardo

The stems of shrubs of rabbit brush, Chrysothamnus nauseosus var. occidentalis, become blackened with this fungus when it attacks a shrub. This is found occasionally on host shrubs in the Manzanita Lake area.

Collections: 26669, 34156, 39390.

Dates: 7-1-50, 7-7-63, 7-13-68.

Abundance: IV, B.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: Washington, California, Mt. Shasta, LVNP.

Fusarium dimerum Penzig in Saccardo

Isolated from a soil sample collected near a litter can at the Manzanita Lake Visitor Center.

Date: 7-8-63.

Abundance: V, D.

Associate: Pinus jeffreyi.

Distribution: Europe, Asia, North America, LVNP.

Fusarium oxysporum Schlechtendahl emend. Snyder & Hansen pro parte

Isolated from soil samples collected near a litter can at the Manzanita Lake Visitor Center, and from soil in the Manzanita Lake Campground at a chaparral campsite in a table and a stove area, and at a stove area under Pinus jeffreyi.

Date: 7-8-63.

Abundance: IV, D.

Associates: Pinus jeffreyi, Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Gilmanella humicola Barron

Isolated from soil samples from near a litter can near the Manzanita Lake Visitor Center, from near a bench at the Ranger Station, and from soil in the Ranger Station lawn.

Date: 7-8-63.

Abundance: IV, D.

Associates: Pinus jeffreyi, lawn grasses.

Distribution: North America, LVNP.

Gliocladium deliquescens Sopp

Isolated from soil in a stove area in a chaparral campsite in the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: V, D.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: Europe, North America, LVNP.

Gliocladium fimbriatum Gilman & Abbott

Isolated from soil in the lawn at the Manzanita Lake Ranger Station.

Date: 7-8-63.

Abundance: V, D.

Associates: Pinus jeffreyi, grasses in lawn.

Distribution: Asia, North America, LVNP

Humicola grisea Traaen

Isolated from soil in a table area in a chaparral campsite in the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: V, D.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: England, North America, LVNP.

Knetia corticola W. B. Cooke

Found on bark of Abies magnifica in the Winter Sports area below the Sulphur Works.

Collection: 26627 TYPE

Date: 7-1-50.

Abundance: V, A.

Associates: Abies magnifica.

Distribution: Lassen Volcanic National Park.

Monilia sitophila (Montagne) Saccardo

Isolated from a soil sample taken near a table in a campsite under Pinus jeffreyi in the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: V, D.

Associates: Pinus jeffreyi.

Distribution: Cosmopolitan, LVNP.

Monodictys levis (Wiltshire) Hughes

Isolated from water and sediment in Emerald Lake; and from soil samples taken near a litter can at the Manzanita Lake Visitor Center, and from soil samples taken in the Manzanita Lake Campground in a tent area in a chaparral campsite, and in a table area in a campsite under Jeffrey pine.

Dates: 8-18-57, 7-8-63.

Abundance: IV, D.

Associates: Pinus jeffreyi, Arctostaphylos^S patula, Ceanothus velutinus.

Distribution: Europe, California, LVNP.

Mycogone calospora (Karsten) von Hoehnel

Found on an old "Cleaveria" at Sunflower Flats.

Collection: 30302, identified by C. T. Rogerson.

Date: 7-8-68.

Abundance: V, F.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Europe, North America, LVNP.

Oidiodendron truncatum Barron

Found on rotting wood of Abies magnifica along the Mt. Harkness Trail.

Collection: 42794, identified by M. B. Ellis, CMI*165403.

Date: 7-27-70.

Abundance: V, A.

Associates: Abies magnifica.

Distribution: North America, LVNP.

Paecilomyces varioti Bainier

Isolated from a soil sample from a table area in a chaparral campsite at Manzanita Lake Campground.

Date: 7-8-63.

Abundance: V, D.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Penicillium spp.

Found on an improperly dried^d specimen of Inonotus dryadeus shipped from Mineral to Cincinnati. Isolated from all but water samples from Lake Helen, from all samples from Emerald Lake, and from all soil samples from the Manzanita Lake area.

Collection: 41549.

Dates: 8-18-57, 7-8-63, 9-29-69.

Penicillium canescens Sopp

Isolated from soil taken near a litter can at the Manzanita Lake Visitor Center.

Date: 7-8-63.

Abundance: V, D.

Associate: Pinus jeffreyi

Distribution: Widespread but occasional, LVNP.

Penicillium chrysogenum Thom

Isolated from lake bottom soil about 10 feet from the shore and from moist soil about 10 feet from the lake shore at Lake Helen, and from a soil sample taken at a bench near the Manzanita Lake Ranger Station.

Dates: 8-18-57, 7-8-63.

Abundance: IV, D.

Associates: Lake shore herbs, grasses and sedges; Pinus jeffreyi.

Distribution: Widespread, LVNP.

Penicillium clavigerum Demelius

Isolated from a soil sample from the ⁶²Manzanita Lake area.

Date: 7-8-63.

Abundance: V, D.

Associates: Pinus jeffreyi.

Distribution: Infrequent, LVNP.

Penicillium crustosum Thom

Isolated from a sample of soil from a tent area in a chaparral campsite at the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: V, D.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: Widespread, LVNP.

Penicillium janthinellum Biourge

Isolated from all soil samples collected at Lake Helen, from Emerald Lake water, and from soil near a stove in a chaparral campsite in the Manzanita Lake Campground.

Dates: 8-18-57, 7-8-63.

Abundance: IV, D.

Associates: Lake water and soil species; Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Penicillium lesseni Paden

Isolated by an alcohol technique from soil from a mixed conifer stand at about 1200 m between Morgan Springs and Deer Creek Pass, Lassen National Forest, Tehama Co.

Date: 1969.

Abundance: V, D.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: Tehama Co., California.

Penicillium lilacinum Thom

Isolated from soil samples from a tent area in a chaparral campsite, and from a table area in a campsite under Pinus jeffreyi at the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: IV, D.

Associates: Pinus jeffreyi; Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Penicillium martensii Biourge

Isolated from a soil sample from a stove area in a chaparral campsite in the Manzanita Lake Campground.

Date: 7-8-63.

Abundance: VI, D.

Associates: Arctostaphylos patula, Ceanothus velutinus.

Distribution: World-wide, LVNP.

Penicillium nigricans (Bainier) Thom

Isolated from soil samples from near the litter can at the Manzanita Lake Visitor Center, from an undisturbed area under Pinus jeffreyi and chaparral near the Manzanita Lake Campground^d; and from a table area, a tent area, and a stove area in a chaparral campsite, and from a table area in a campsite from under Pinus jeffreyi.

Date: 7-8-63.

Abundance: III, D.

Associates: Pinus jeffreyi, Arctostaphylos patula, Ceanothus velutinus.

Distribution: Widespread, LVNP.

Penicillium thomii Maire

Isolated from soil samples from an undisturbed area under Pinus jeffreyi and chaparral near the Manzanita Lake Campground, from a tent area, a stove area, and a table area in a chaparral campsite, and from a tent area and a table area in a campsite under Pinus jeffreyi.

Date: 7-8-63.

Abundance: III, D.

Associates: Pinus jeffreyi, Arctostaphylos patula, Ceanothus velutinus.

Distribution: Widespread, LVNP.

Penicillium waksmanii Zaleski

Isolated from a soil sample from near the litter can at the Manzanita Lake Visitor Center.

Date: 7-8-63.

Abundance: V, D.

Associates: Pinus jeffreyi.

Distribution: Widespread, LVNP.

Phielophora sp.

Isolated from water and from shore sediments collected at Lake Helen.

Date: 8-18-57.

Polydesmus (nr.) sp.

Found on Arctostaphylos patula, base of Shasta View Trail.

Collection: 34911, identified by M. B. Ellis, CMI-165367.

Date: 7-2-65.

Ramularia lappulae J. J. Davis

Occasional leaves on occasional plants of Hackelia floribunda in the vicinity of Cold Boiling Lake were found diseased by the fungus.

Collection: 37102.

Date: 7-9-66.

Abundance: V, C.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Wisconsin, LVNP.

Ramularia pusilla Unger

Ovularia pusilla (Unger) Saccardo & D. Saccardo

Dr. Lee Bonar has found the leaves of the grass Glyceria elata parasitized by this fungus.

Collection: Lee Bonar.

Date: 1934.

Abundance: V, C.

Associates: Meadow plants.

Distribution: Washington, California, LVNP.

Ramularia lupini J. J. Davis

Found on Lupinus polyphyllus in Conard Meadows.

Collection: H. Stanley.

Date: 8-28-72.

Abundance: V, C.

Associates: Poa magnifica, meadow grasses and herbs.

Distribution: Texas, Washington, California, LVNP.

Rhinocladia mansonii (Castellani) Schol-Schwarz

Isolated from soil collected near the litter can at the Manzanita Lake Visitor Center, from soil near a bench near the Ranger Station, from a table area in a campsite in chaparral, and from a table area in a campsite under Pinus jeffreyi.

Date: 7-8-63.

Abundance: IV, D.

Associates: Pinus jeffreyi, Arctostaphylos patula, Ceanothus velutinus.

Distribution: Cosmopolitan, LVNP.

Scolecotrichum graminis Fuckel

This leaf spot-producing fungus has been found on Sitanion hystrix on the Paradise Meadow Trail.

Collection: 34214.

Date: 7-7-63.

Abundance: V, C.

Associates: Grasses and herbs in open dry woods.

Distribution: On many grasses in Europe, North America, LVNP.

Sepedonium chrysospermum Bulliard ex Fries

This golden yellow mold occasionally parasitizes some kinds of mushrooms, most commonly species of Boletus; the Sulphur Works area.

Collection: 29559.

Date: 7-2-54.

Abundance: V, F.

Associates: Abies magnifica.

Distribution: Siberia, Europe, North America, Mt. Shasta, LVNP.

Sporidesmium larvatum M. C. Cooke & Ellis

Found on conifer wood in the Sunflower Flats area.

Collection: 34927A-s, identified by M. B. Ellis, CMI-165370.

Date: 7-2-65.

Abundance: V, A.

Associates: Abies concolor, Pinus jeffreyi.

Distribution: North America, LVNP.

Stemphylium sp.

Isolated from soil from near the litter can at the Manzanita Lake Visitor Center, and from soil in the lawn at the Manzanita Lake Ranger Station.

Date: 7-8-63.

Teniolella sp.

Found as a black mold on dead branches of Alnus tenuifolia.

Collection: 35006, identified by M. B. Ellis, CMI-165371.

Date: 7-4-65.

Trichoderma harzianum Rifai

On an imperfectly dried fruit body of Inonotus dryadeus shipped from

Mineral to Cincinnati.

Collection: 41546.

Date: 9-26-69.

Abundance: V, F.

Associates: Other molds on this conk.

Distribution: Widespread, California.

Trichoderma sporulosum (Link) Hughes

Specimens of Stereum rugisporum were found covered with this mold which forms white to cream colored cottony growth on this fungus.

Collections: 37146, 38709, 42886.

Dates: 7-11-66, 8-11-67, 7-30-70.

Abundance: IV, F.

Associates: Abies magnifica, Tsuga mertensiana.

Distribution: Widespread, LVNP.

Trichoderma viride Persoon ex Fries sensu latissimo

This is one of the molds isolated from soils from summit fumaroles. It has also been found on a species of Thelephora. Isolated from wet soil near a boulder 100 ft. below the summit of Lassen Peak, from mineralized soil at a summit fumarole, from soil in the fumarole once used to burn garbage, from moist soil under Pinus albicaulis near upper timberline, from moist soil near Tsuga mertensiana at about 9,000 ft., from soil and duff in open areas in Abies magnifica forest, from soil in a wet sedge meadow at Cold Boiling Lake, from bottom soil in a pool at Cold Boiling Lake, and from surface scum in a seepage area in Cold Boiling Lake. Isolated from all soil samples collected in the Manzanita Lake area.

Collections: 34919.

Dates: 7-21-56, 7-8-63, 7-2-65.

Abundance: I, D, F.

Associates: Most forest, meadow, and chaparral plants in the Park.

Distribution: Cosmopolitan, LVNP.

Trichothecium roseum Link ex Fries

This is a pink mold which is sometimes found on various kinds of litter and organic debris as well as wood of old logs, usually after the snow melts.

Collections: 26603, 29569, 30397, 34959, 42900, 45494, 49328.

Dates: 7-1-50, 7-2-54, 7-22-56, 7-3-65, 7-27-70, 7-30-70, 7-9-72, 8-27-74.

Abundance: III, A.

Associates: Conifer trees throughout the Park.

Distribution: Cosmopolitan, LVNP.

Ulocladium botrytis Preuss

Isolated from soil collected near the litter can at the Manzanita Lake Visitor Center.

Date: 7-8-63.

Abundance: V, D.

Associate: Pinus jeffreyi.

Distribution: United States, LVNP.

HOST INDEX

(Hosts alphabetical within each category)

(Fungi alphabetical for each host)

CONIFEROUS TREES

Abies concolor

Aleurodiscus amorphus
Collybia bakerensis
Echinodontium tinctorium
Fomitopsis pinicola
Galerina autumnalis
Ganoderma applanatum
Ganoderma oregonense
Herpotrichia juniperi
Hyphodontia pallidula
Ischnoderma resinosa
Lachnellula arida
Lericifomes officinalis
Lophodermium decorum
Melanconium sp.
Merulius tremellosus
Mollisia piceae
Pellicularia subcoronata
Phlebia albida
Physalospora abietina
Sarcotrichia balsamiae
Stereum rugisporum
Trechispora vaga

Abies magnifica

Athelia raunkieri
Aurantiporellus alboluteus
Clithris crispa
Collybia bakerensis
Corticium corrugae
Crepidotus sp.
Cryptoporus volvatus
Fomitopsis pinicola
Ganoderma oregonense
Gloeocystidiellum sp.
Guepinopsis alpinus
Herpotrichia juniperi
Heterobasidium annosum
Hirschioporus abietinus
Kmetia corticola
Lachnellula agassizii
Lachnellula arida
Lachnellula chrysophthalma

Abies magnifica (cont'd)

Laetiporus sulphureus
Melampsorella caryophyllacearum
Mollisia cinerea
Mycena overholtsii
Oidiodendron truncatum
Peniophora violaceo-livida
Phellinus ferreus
Phlebia albida
Pholiota bridgii
Pucciniastrum goeppertianum
Serpula lacrimans var. shastensis
Spongiporus leucospongia
Trechispora candidissima
Trichosphaeria solaris
Tyromyces caesius
Xenasma filicina

Pinus albicaulis

Herpotrichia coulteri
Lachnellula arida
Lachnellula chrysophthalma

Pinus contorta var. murrayana

Cronartium coleosporoides
Cryptoporus volvatus
Herpotrichia coulteri
Laricifomes officinalis
Lentinus ponderosus
Phaeolus schweinitzii
Spongiporus leucospongia
Stereum rugisporum
Thelephora terrestris

Pinus jeffreyi

Davisomycella medusae
Elytroderma deformans
Fomitopsis pinicola
Ganoderma applanatum
Ganoderma lucidum
Lophodermium pinastri

Pinus lambertiana

Hirschioporus laricinus

Pinus monticola

Lophodermium pinastri
Spongiporus leucospongia
Stereum rugisporum

Pinus ponderosa

Pinus ponderosaInonotus dryadeusPhaeolus schweinitziiTsuga mertensianaAthelia galziniiAurantiooporellus alboluteusClithris crispaCorticium corrugaeCollybia bakerensisDasyscyphus serinellusDiatrypella rimosaFomitopsis pinicolaGanoderma oregonenseGuepiniopsis alpinusHerpotrichia juniperiHirschioporus abietinusLericifomes officinalisLachnellula aridaLachnellula chrysophthalmaLentinellus montanusMycena overholtsiiPhellinus nigrolimitatusPhlebia albidaPoria cocosPoria johnstoniiSerpula lacrimans var. shastensisSpongiporus leucospongiaStereum rugisporumTrechispora farinacea

BROAD-LEAVED TREES AND SHRUBS

Alnus tenuifoliaDasyscyphus bicolor var. bicolorDasyscyphus virgineusDiatrypella discoidea var. alniPolyporus elegansStereum hirsutumStereum sanguinolentumTaphrina occidentalisTaeniolella sp.Arctostaphylos nevadensisChlorociboria sp.Coniothyrium arctostaphyliExobasidium vacciniiGloniella lapponica"Hypoderma" tunicatum

Arctostaphylos patula

Aleurodiscus difissus
Berlesiella sp.
Coniothyrium arctostaphyli
Cryptostictis arbuti
Dasyscyphus bicolor var. bicolor
Exobasidium vaccinii
?Haglundia perelegans
Lophium elatum
Peniophora incarnata
Polydesmus sp.
Stereum hirsutum

Ceanothus velutinus

Cenangium aureum
Dasyscyphus bicolor var. bicolor
Dasyscyphus succineus
Hymenochaete arida
Hypoxyton mediterraneum

Chrysolepsis sempervirens

Dothidella janus
Taphrina castanopsidis

Chrysothamnus nauseosus var. occidentalis

Epochnium isthomorphum
Lophiostoma caulium var. congregata

Haplopappus bloomeri

Teichospora pomiformis

Holodiscus microphyllus

Mycomicrothelia macularis

Populus tremuloides

Ceratocystis ?pilifera
Chlorociboria sp.
Dasyscyphus bicolor var. bicolor
Dasyscyphus virgineus
Phellinus igniarius
Scytinostroma sp.
Stereum hirsutum
Trichopezizella reiliane var. macrospora

Populus trichocarpa

Bjerkandera adusta
Colpoma crispum
Cyphellopsis anomala
Phellinus igniarius
Stereum hirsutum

Prunus emarginata

Taphrina flectens

Salix spp.

Bahusekala sp.
Dendryphium atrum
Lachnella eruciformis
Phellinus igniarius
Polyporus squamosus
Schizophyllum commune
Stereum hirsutum

Salix laevigata

Taphrina populi-salicis

Salix ?lasianandra

Cyphellopsis anomala
Melampsora ribesii-purpurea

Vaccinium nivicitum

Pucciniastrum goeppertianum

HERBS, GRASSES, AND SEDGES

Allium validum

Apiosporella mimuli

Allium campanulatum

Puccinia mutabilis

Arabis platysperma

Puccinia monoica

Bromus sp.

Cladosporium herbarum

Bromus carinatus

Ustilago bullata

Bromus marginatus

Ustilago bullata

Caltha biflora

Fabraea rousseauana

Calyptridium umbellatum

Uromyces spragueae

Carex spp.

"Cintractia caricis"

Leptosphaeria vagans

Carex fracta

"Cintractia caricis"

Septoria lunelliana

Carex ?lemonii

Puccinia caricis

Carex luzulaefolia

"Cintractia caricis"

Carex multicosta

Puccinia caricis

Carex nebraskensis

Puccinia caricis

Carex specifica

Puccinia caricis

Carex spectabilis

Anthracoidea stratae

Cladosporium herbarum

Carex eurycarpa

Mycosphaerella tassiana

Cirsium douglasii var. canescens

Puccinia calcitrapae

Elymus glaucus

Ustilago spgazzinii var. agrestis

Eriogonum nudum

Uromyces intricatus

Eriogonum umbellatum

Uromyces intricatus

Gayophytum sp.

Puccinia gayophyti

Glyceria elata

Ramularia pusilla

Habenaria ?leucostachya

Puccinia praegracilis

Heckelia floribunda

Ramularia leppulae

Hieracium sp.

Puccinia hieracii

Hieracium albiflorum

Puccinia hieracii

Juncus balticus var. montanus

Arthrimum cuspidatum

Juncus howellii

Uromyces junci-effusi

Juncus parryi

Bifusella acuminata

Metasphaeria sepalorum

Lupinus sp.

Phyllosticta ferax

Lupinus obtusilobus

Hendersonia sp.

Mycosphaerella tassiana

Lupinus polyphyllus

Remularia lupini

Lupinus sellulus

Phyllosticta ferax

Micrasteris gracilis

Puccinia plumbriae

Mitella pentandra

Puccinia heucherae

Monardella odoratissima ssp. pallida

Phyllosticta monardellae

Pleospora richtophensis

Puccinia menthae

Osmorhiza occidentalis

Puccinia pimpinellae

Phlox douglasii

Pleospora tragacanthae

Polygonum bistortoides

Sphacelotheca hydropiperis

Polygonum newberryi

Puccinia amphispilusa

Polygonum shastense

Ustilago shastense

Potentilla sp.

Phragmidium ivesiae

Sitenion hystrix

Scolecotrichum graminis
Ustilago spegazzini var. agrestis
Ustilago striæformis

Sitenion jubatum

Leptosphaeria vagans

Stephanomeria lactucina

Puccinia harknessii

Urtica gracilis var. holosericea

Puccinia caricis

Veratrum californicum

Botrytis cinerea
Cylindrosporium veratrinum
Diplodia veratri
Phyllosticta melanoplaca

Viola sp.

Puccinia violæ

FUNGI

Boletus sp.

Sepedonium chrysospermum

Clavaria sp.

Mycogone calospora

Laetiporus sulphureus

Hyphomyces surantiacus

Mycena sp.

Cladobotryum variospermum

Polyporus sp.

Cladobotryum variospermum

Stereum rugisporum

Trichoderma sporulosum

LICHENS

Three important types of lichen growth occur. Some are bushy or fruticose, like the staghorn and beard lichens; some form large leaf-like or foliose patches on rock or bark surfaces, like the Parmelias and the dog-lichen; and others are crustose, forming small to large patches like crusts on bark and rocks. Some of these growths are very colorful, others are dull or black.

The species of lichens collected to date in the Park will be listed by the localities in which they were found. ^{Five} ~~Four~~ of these groups of species were collected on rocks, the others on fir tree branches. Except for the Gyrophora, which is foliose, the species listed from rocks are crustose. On the other hand, those from tree branches are foliose - Nephromopsis and Parmelia, or fruticose - Alectoria and Letharia.

A rock on the outer rim of the Summit crater complex near the Summit Trail is the only place on the summit where lichens have been found. Activities of vulcanism such as solfatare fumaroles, sulphur springs, and volcanic eruptions, prevent the development of lichens which are very sensitive to atmospheric pollution especially by sulphur compounds. Eruptions have occurred recently enough so that the recolonization of rocks near the summit has not yet occurred. The following species were found on this rock:

Lecanora peltata (Ram.) Steud.
Lecanora melanophthalma (DC.) Hammond
Lecidea atro-brunnea (Ram.) Scheerer.

Rock outcroppings along the Summit Trail, especially near a former rest station, support several colonies of lichens of various colors:

Acarospora oxytona (Ach.) Mass. - yellow.
Caloplaca elegans (Link) Th. Fries - cinnamon red.
Gyrophora decussata (Vill.) A. Zehlbr. - black.
Lecanora melanophthalma (DC.) Ram. - brown with black eye spots.

Rock outcroppings, boulders, and platy andesite form good habitats for lichens. Several species were found on such rocks at King Creek Cascades:

Candelariella crenulata (Wahlbr.) A. Zahl.
Lecanora gibbosa (Ach.) Nyl.
Lecanora muralis (Schreb.) Rabenh. var. diffRACTA (Ach.) Rabenh.
Lecanora rubina (Vill.) Ach.
Lecidea atro-brunnea (Ram.) Schaerer
Lecidea fusco-atra (L.) Ach.

A few lichens grow on smooth stones in cold running water. One species was found in King Creek below the Falls on the trail to Sifford Lakes:

Dermatocarpon minutum (L.) Mann

Tuffa outcroppings and rocks are found in the woods between ^{at} ~~Mel~~zanita Lake and Loomis Peak. On some of these the following species were found:

Lecanora cinerea Roehl.
Lecanora gibbosa (Ach.) Nyl.
Lecanora polytropa (Ehrh.) Rab.
Lecanora rubina (Vill.) Ach.
Lecidea atro-brunnea (Ram.) Schaerer
Lecidea fusco-atra (L.) Ach.
Lecidea plana (Lehm.) Nyl.
Rhizocarpon strobrunnea (L.) DC.
Rhizocarpon geographicum (L.) DC.

Several foliose and fruticose species of lichens were found on the branches of Abies concolor in a grove along the highway in the Nobles'

Immigrant Pass area:

Alectoria fremontii Tuck.
Alectoria jubata (L.) Ach.
Alectoria oregana Tuck.
Letharia vulpina (L.) Vainio
Nephromopsis platyphylla (Tuck.) Herre
Parmelia olivacea (L.) Ach.
Parmelia vittata (Ach.) Roehl. (material atypical)

These 25 species of lichens are probably a small fraction of the species which occur in the Park. Species which occur on bark of trees and shrubs have been looked for casually and found in abundance only in one area.

However, an exhaustive search of the Park for the species which may occur there must await time and opportunity. The same may be said for rock surfaces and soil areas. Where surfaces have been exposed for a long time without volcanic activity involvement, one may expect to find a number of species in addition to those listed above.

Lichens are thought by many to be important pioneers of bare rock surfaces. In many places they are the only organisms which appear to be present on bare rocks where they must withstand the intense heat of the sun and the great amounts of cold which come with winter's ice and snow. They are able to cling to the rocks because they secrete acids which eat away the rock surface giving tiny filaments of fungus tissue a chance to take hold and cling tightly. As more lichen material develops some dies, sand and soil-like material forms, and in such a pocket mosses and even some seeds can catch hold and germinate. In this way a small plant community can start to develop.

For identifications of the lichens listed above I am indebted to the late A. W. Herre. Those parts of collections which he retained are now in the Los Angeles County Museum Herbarium. My portions are in the Herbarium of Miami University, Oxford, Ohio.